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Liquid Rubber and Textiles

Webster Norris

THE development of methods of applying latex and liquid rubber is rapidly growing in interest and is extending the use of rubber in divers and unexpected ways. The old established method of proofing and impregnating with solvent cements of rubber is in a fair way to be superseded by liquid rubber methods. In fact the advantages of liquid rubber technology will result in establishing many new applications of rubber. These already appear in important fields, as textiles, paper, and leather.

The customary methods for processing dry rubber involve the operation of heavy and complicated machinery, and the consumption of much power. In the cement and proofing departments considerable fire hazard is inevitably engendered. Regardless of inherent difficulties the methods for dry rubber working are highly perfected, and innumerable applications are made of vulcanized rubber by itself and in construction with textiles.

The new technology of rubber now in development concerns the preparation and application of liquid rubber as latex and water dispersions for the manufacture of rubber goods. While later methods are designed to supplement rather than to supersede the older ones, a greater or less displacement of the latter is certain to take place. The pronounced advantages of operating with liquid rubber have at once made available many new applications for which dry rubber cannot be used.

Textiles in particular offer an extensive field in which liquid rubber can be conveniently and economically utilized with much benefit by the textile manufacturer. Textile interests of Europe and the United States are adding liquid rubber working equipment to their fabric processes and for the development of new textile-rubber combinations merchandised through textile outlet channels.

The rubber field is so unfamiliar to textile manufacturers, engineers, and designers that it seems appropriate to outline briefly some essential information on latex and other forms of liquid rubber and the principal items of equipment for their use.

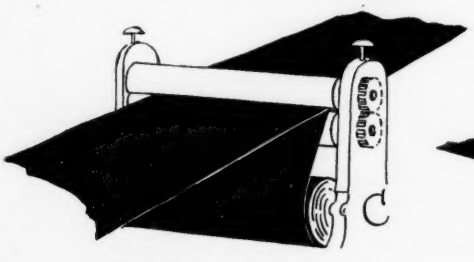
Latex

Latex or rubber milk is the original form of liquid rubber. It is obtained by tapping the middle layer of the bark of the *Hevea braziliensis* or rubber tree of the far eastern rubber plantations. The typical composition of fresh rubber latex is stated in the following analysis.[1]

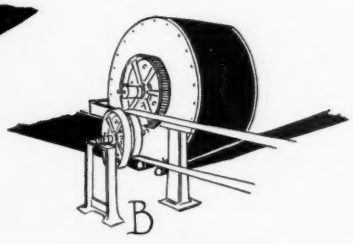
	Latex from 10-Year Old Trees
Acetone soluble (resin, fatty acid, and carbohydrates)	1.65
Protein	2.03
Ash	0.70
Caoutchouc (by difference)	35.62
Water	60.00
	100.00

Fresh latex is subject to rapid bacteriological changes, which prevent long distance transportation and necessitate prompt application of means for coagulating or separating its caoutchouc content to obtain the crude rubber of commerce. The earliest experimenters with rubber, notably Thomas Hancock of England, appreciated the advantages of working with liquid rubber. But owing to the absence

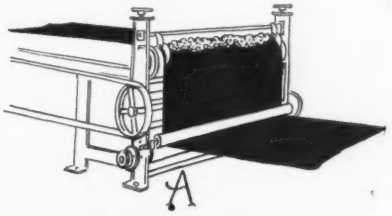
[1] "The Applications and Analysis of Latex." W. H. Stevens, *I. R. I. Transactions*, Vol. V, No. 5, 1930.



C—Doubling Calender.



B—Drum Drier.



A—Rubberizing the Fabric.

of known means for preserving latex for long distance transportation their efforts failed; so they proceeded to work with crude rubber.

It was discovered ultimately that the addition of ammonia in small proportion to latex preserves it and allows it to be transported without coagulation. In this form approximately 5,765,694 pounds of liquid latex were imported in 1929 into the United States from the Far East.

There are three principal commercial forms in which latex is prepared for rubber manufacturing purposes. All are patented. These preparations are known commercially as Revertex, Lotol, and Vultex.

Revertex

Revertex is concentrated rubber latex prepared by a patented method, which briefly, is as follows: The latex is brought to the plantation factory where it is strained and placed in large vessels with a preservative agent. Just before the latex is put into the special evaporating machine, protective colloids are added to it. The evaporation process is continued until the original latex becomes of pasty consistency. This condition occurs when its water content is reduced to about 25 per cent. Consequently the Revertex is then concentrated to about 75 per cent. At this point the material is discharged into cooling vessels and packed in shipping containers. By the addition of preferably distilled water the concentration can be adjusted to any consistency desired. The dilution is best carried out as follows:

Approximately one-third of the quantity of water required for the desired dilution is first added to a corresponding quantity of Revertex and left to stand for about one hour. During this time the paste swells considerably; consequently very rapid and complete dispersion takes place after the remaining water is added. It is also possible to dilute the paste by adding water continuously while stirring the mixture.

Revertex can be compounded very easily with various kinds of filling ingredients as well as with vulcanizing agents. In its pure or compounded condition this material can be used advantageously for proofing fabrics and for combining double textures and similar products.

Lotol

Lotol is a rubber product introduced in 1924 for use in rubber goods and other manufactures. It is obtained from rubber latex by special process. Lotol adhesives are designed to replace rubber cement in rubberizing fabrics. They are nonflammable because they contain water instead of a volatile solvent. This fact entirely eliminates fire hazard from spreader work.

Lotol contains from two to three times as much actual rubber content as ordinary rubber cement contains. For this reason fabrics can be rubberized more heavily by a single application of Lotol than by two or three coats of ordinary cement. In other words Lotol will coat triple the yardage output of a standard spreader. As in other preparations of latex the rubber in Lotol is unimpaired in quality because it has never been milled, heated, or dissolved in solvents. This liquid rubber comes prepared in colors and compounded to meet the technical purpose desired.

Vultex

Vultex is vulcanized rubber latex prepared under the Schidrowitz patents and is one of the important developments of a singularly interesting raw material. The processes employed in the preparation of Vultex have prepared the way for the use of latex in many industries in which previously rubber had no place. For example, manufacturers of plush and pile fabrics for use in automobile upholstery have discovered an important and growing use for this material as a backing for their goods.

Another important development now in the experimental stage is the use of Vultex in manufacturing inner tubes for automobile tires. In all road tests these tubes have shown great strength and wearing quality. Other new applications are in process of development, which will not only improve present products but also will create new articles of commerce.

Liquid Rubber Processing

Processing liquid rubber is done by direct and simplified methods with much saving of plant investment for machinery, power, and space. Mills and calenders can be dispensed with, and relatively light powered mixers substituted for compounding the stock without injury to the physical properties of the rubber.

Another highly important advantage in liquid rubber working is the entire elimination of fire risk, which is ever present in the methods of preparing rubber cements and rubber dough for ordinary rubberizing. Proofing for single and double textures can thus be done with perfect safety since the vehicle evaporated is water instead of a volatile flammable solvent.

The equipment necessary for rubberizing fabrics for single and double textures varies only in the substitution of a horizontal dough mixer for preparing the compounded latex. This type of mixer is built with either one or a pair of blades as desired. A latex or liquid rubber mixing while wet is easily washed out from the mixer or container by a stream of water. When dry, rubbing is required to remove the mix.

Practically any type of spreading machine suitable for proofing textiles is used with latex. It is advisable, however, to have the doctor blade stand at right angles to the fabric instead of in the slanting position that is usual when proofing with naphtha solutions of rubber. The spreading, drying, and doubling are illustrated on the preceding page.

Rubberizing the fabric represented at *A* is effected on the upper side of the cloth as it passes under the heavy iron doctor blade. This blade, pressing tightly against the cloth, holds back the bank of mixing, which revolves upon the cloth and penetrates it more or less. The amount of the coating is regulated by the pressure of the iron blade against the fabric.

In the standard spreader the moisture is dried from the fabric and coating by passage over a series of steam return bends above which the goods are moved to the rear end of the machine, returning to the front end and wind-up device. The passage from front to rear of the machine and return over and under the coils effectively dries the fabric.

A preferred method for drying the coated fabric is indicated at *B*, which represents a large sheet metal drum through which low pressure steam circulates. This drum displaces the usual steam return bends and receives the coated fabric as soon as it is spread. In drying on the drum the fabric practically encircles it, guided by a pair of small idler rollers below the drum. The advantage of the drum method of drying over the ordinary return bend method is that the fabric is dried under tension and thus its shrinkage is prevented.

Two rubberized fabrics are combined to form a "double texture" by passing goods through a doubling calender, as at *C* in the picture. This machine consists of a pair of smooth cold iron rolls set one above the other in housings with hand screws for adjusting the rolls tightly together, compressing the rubbered surfaces of the fabrics.

Vulcanizing

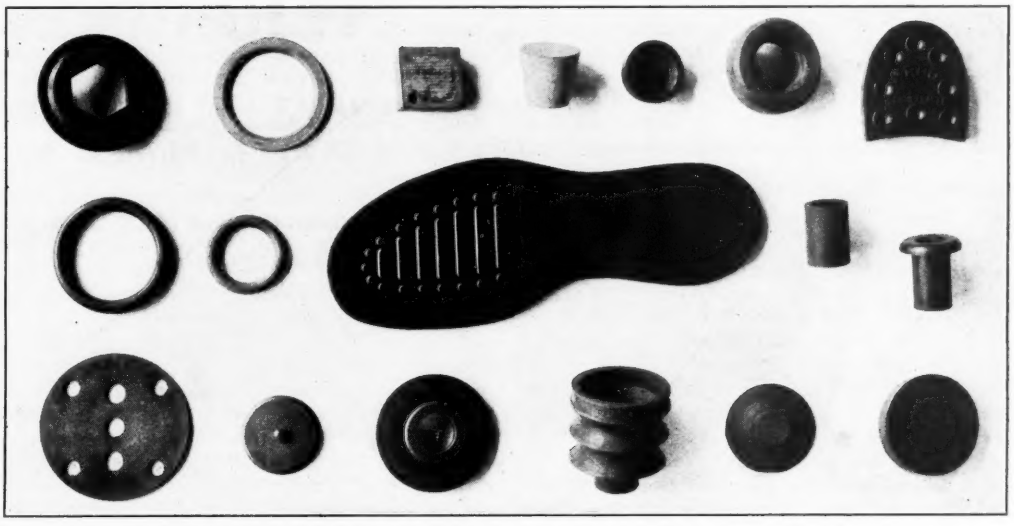
It is possible with a drum drier continuously to vulcanize light proofing of highly accelerated composition. In the case of proofing with Vultex no vulcanizing is needed since the material is vulcanized in latex by its original preparation. Heavy coatings of other latex and liquid rubber preparations on single or double texture are vulcanized in a dry heater of the type described in this journal.[2]

[2] "Dry Heat Vulcanizer." INDIA RUBBER WORLD, December 1, 1930, p. 63.

Philippine Rubber Products

Made from Philippine Grown Rubber by Native Workmen

E. W. Snyder



A Group of Mechanical Rubber Goods Made in the Philippine Islands

THE growth of rubber on a commercial scale in the Philippine Islands begun fifteen years ago is now successfully established, as also is the first manufacturing plant for the production of mechanical rubber goods, erected and operated by the Manila Rubber Co. located at Lorenzo de la Paz, Pandacan, Manila.

This factory equipped with modern rubber working machinery from the United States began operation in January, 1930, to supply by local production the rapidly growing demand of the Philippines for rubber goods particularly for industrial purposes.

The principal consumers of such goods include the various industries located in Manila and throughout the islands, such as sugar centrals, rice and coconut oil mills, railway and street-car companies, inter-island and trans-Pacific shipping, oil and gasoline stations, automobile accessories, electric insulation, rubber heels and soles, etc. These varied demands run into hundreds of different molded items. The distinct advantage of producing these goods in Manila results from the ability to supply the local industries promptly with fresh goods.

In the absence of local service from sixty to ninety days are required to obtain shipments from the United States. In the tropics, furthermore, rubber goods deteriorate more rapidly than in the temperate zones; consequently these products should not be held too long in stock.

In the case of the Manila Rubber Co. all of the rubber used is raised in the Philippines. The reclaim and the compounding ingredients, however, are imported from the United States. The output is limited thus far to molded rubbers in great variety, mostly items of small size. The molds for these goods, a representative group collection of which is here pictured, are all made in the company's machine shop by native workmen. In fact Filipino labor is used in all departments of the factory and has proved skillful and dependable. The native mind is imitative rather than independent and inventive.

The outlook for crude rubber and rubber goods manufacturing is very encouraging and should develop into one of the leading industries of the islands.

In the production of rubber goods for tropical use special consideration must be given to the nine-month period when the day temperature registers 90° F., and higher. These conditions call for skill in designing rubber mixings and in curing the goods.

Typical items that are specially liable to rapid deterioration in service are automobile hydraulic brake washers being in constant contact with warm oil, rice hulling cones that must remain soft and tough enough to function properly, vacuum cups, and gaskets for gasoline containers, gaskets for Diesel engines demanding great toughness and heat resistance.

Other specially compounded goods are hard rubber washers of graphitic stock made to meet the unusually severe conditions encountered in air compressors, the oil resisting air control gaskets for street car air brakes, electrical insulators, and hard rubber circuit breakers with high di-electric resistance.

Other mechanical goods for services of less exacting nature include band-saw bands, bottle-washer rings, molded treads for truck wheels, hard rubber gaskets for percolators, filter press gaskets, and various other small items for plumbers' use.

In the field of footwear, production is confined to molded soles, heels, and top lifts in black, white, and tan colors. The output in this line will increase each year as the native Filipinos are more and more adopting the custom of wearing shoes in place of going barefoot.

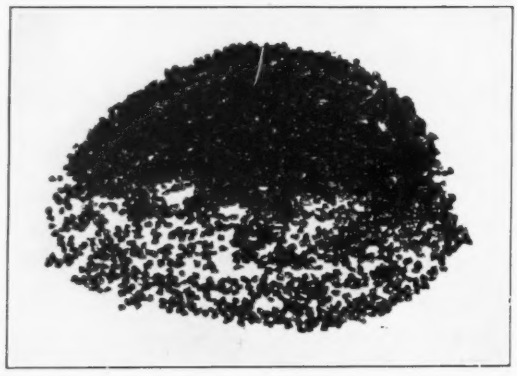


Fig. 1. No. 14 Alumina

Rubber Bonded Grinding Wheels

What the User of Organic Bonded Wheels Should Know

J. N. Kuzmick and J. A. Lange[1]

DUE to the scarcity of comprehensive literature and the apparent secrecy with which the subject of organic bonded grinding wheels is generally treated by manufacturers, the average user knows very little about the composition and useful variations possible by judicious manipulation of ingredients and processes.

Briefly, an organic bonded grinding wheel consists of granular abrasive particles bonded or retained in rigid form with rubber, phenol resinoids, or shellac. Any succeeding mention of bond or binder will pertain only to rubber.

The bulk of abrasives used are manufactured alumina (Al_2O_3) and silicon carbide (SiC). They are products of the arc and the resistance furnaces respectively. Abrasive grain or particle sizes are identified by the size of screen mesh over which they are graded. As an example, No. 24 abrasive is one which is graded with a standard screen mesh having twenty-four openings to the inch.

The choice of size and kind of abrasive is governed by the nature of the grinding to be performed. Where the amount of material to be removed by grinding is relatively large, the coarser grain sizes, in general, would be chosen. It does not necessarily follow, however, that a coarse grain wheel is always the fastest cutter. Very often greater rapidity of cutting can be obtained by the use of finer abrasives, bonded to produce a softer grade of wheel. This is particularly true in grinding hardened and some grades of alloy steels.

Ordinarily materials of high tensile strength are ground with wheels of aluminous abrasive, while those of relatively lower tensile strength are ground with silicon carbide. It has been found that with a properly compounded bond it is possible to produce wheels of higher total efficiency by using aluminous abrasive rather than silicon carbide for some of the metals such as cast iron, brass, copper, aluminum, or alloys of these, where at one time silicon carbide was generally used. Silicon carbide is largely confined to wheels for grinding stone, glass, vitreous ware, rubber, etc.

Grade selection or hardness is determined by various factors incident to the particular work to be accomplished. Too often wheels not at all suited to the particular class of work are used, with very unsatisfactory or inefficient results, with the consequence that the rubber bonded type of wheel is totally condemned by the user. In order to avoid such an experience, it is advised that the sales engineer of the supplier be consulted wherever possible and allowed to make a first hand survey of the grinding problem. Where this is not possible, it is recommended that the purchaser in ordering should give a complete detailed description of the operation. This will include data such as description of the article to be ground, finish required, type of grinding machine, exact wheel dimensions, and wheel speeds obtainable. In addition the supplier should know whether the grinding is free hand or is fed to the wheel automatically and whether the grinding is done dry or with a lubricant or coolant. To sum up, the clearer the picture that the wheel manufacturer has, the more intelligently will he be in position to furnish the wheel having the greatest efficiency.

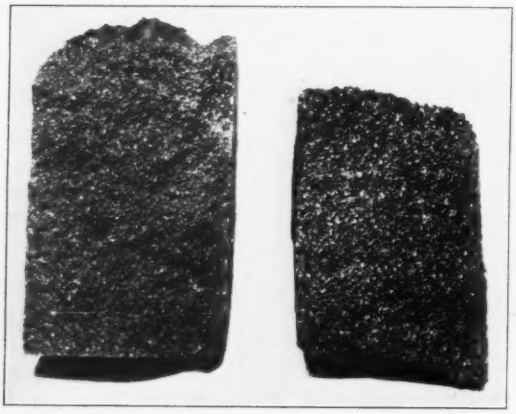


Fig. 2. Cross-Section of Dense, Hard Structure

Fig. 3. Cross-Section of Open, Porous Structure

Rubber bonded wheels will perform most efficiently when operated at their proper recommended speeds. These recommended speeds will vary from 7,500 to 9,000 surface feet per minute. In some cases, as in the use of thin slitting or cutting off wheels, an operating speed of 15,000 surface feet per minute is accepted practice. In either case the manufacturer speed tests the wheels to 50 per cent over recommended operating speed. As rubbber bonded wheels can be operated safely at these higher speeds, it is a loss of economy for users not to avail themselves of this advantage. This does not mean that this type of wheel cannot be used successfully at speeds lower than above. Very satisfactory performance is being obtained in countless instances where machine limitations preclude the use of higher recommended speeds. The results would be still better were it possible to step up the peripheral velocity of the wheels.

In this connection it should be borne in mind that as a wheel reduces in diameter due to wear, a two-fold effect on its operating characteristics results. First, the peripheral speed is lessened, thus

[1]The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J.

dropping cutting rate; and second, the wheel acts softer because of the reduced grinding area and contact, causing the wheel wear rapidly to increase. To offset this wear and to continue the best grinding efficiency, speed changes should be made to maintain recommended peripheral speed. To illustrate an excellent practice of this feature, many of the large users of wheels provide three changes of spindle speed in using, for instance, a wheel from 24-inch diameter to 14-inch, at which diameter it is discarded.

Extreme caution should be used in the provision of speed changing facilities. It is hardly necessary to point out that if a wheel of full size were operated at a speed intended for a wheel at its reduced diameter, the danger of breakage would constitute an inexcusable hazard. For this reason equipment should be foolproof so that it is mechanically impossible for this condition to arise. This precaution can be accomplished in a number of ways, and most of the modern grinding equipment available incorporates this safety feature.

Space will not permit going into details of selection of specifications for individual grinding operations. As there are very few operations on which rubber bonded wheels cannot be used successfully, it will readily be seen that it would be beyond the scope of this paper to refer individually to them. In order that the user may have a clearer conception of the wide range of adaptability of rubber bonded grinding wheels to any particular grinding operation, it might be well to point out how the characteristics can be varied by compounding or processing. To illustrate one phase obtainable by compounding and processing, two types of snagging wheels will be considered. In both cases the kind and size of abrasive will be identical, viz., No. 14 alumina, shown in Figure 1; the proportion of abrasive to rubber is the same.

Figure 2 illustrates a cross-section of dense, hard structure such as is produced by mixing the rubber base stock with abrasive granules on the conventional type of mixing rolls. In this type of processing a considerable amount of the abrasive grains is broken down to finer sizes, owing to the crushing action of the mixing rolls. An illustration of the extent to which this crushing occurs is shown below. The abrasive from a sample of mixed stock was segregated from the bond and screened, with the following results:

Mesh No.	Per Cent
14	27.8
16	24.7
20	14.4
30	6.3
50	7.5
80	5.0
150	3.8
200 and finer	10.5
	100.0

This type of structure is extremely strong although there is little adhesion between the bond and the individual grains. The strength of this type of structure is mainly dependent on mechanical support resulting from its denseness and compactness. A wheel of such structure is particularly adapted to the surfacing of billets of tough, stringy nickel and kindred alloys.

Figure 3 illustrates a cross-section of an open, porous structure obtained by a process in which the abrasive grains are not crushed by mixing. This structure can be effected in several ways, which basically require the rubber base stock to be reduced, for instance, by a solvent or otherwise to a state of plasticity in which the final mixing with the abrasive may be carried on in a paddle or stirring type mixer. In this type of processing fully 98 per cent of the abrasive grains are retained in their original shape and size, as compared with the screen analysis of the Figure 2 type of structure. In the structure shown in Figure 3 the adhesion between the abrasive particles and the adjoining bond is extremely high as compared with that of the Figure 2 type. Examinations of the fracture of tensile test specimens of the Figure 3 structure show grains actually pulled apart. While this structure is very open and porous as contrasted with that of Figure 2, the strength is high because of this adhesion between abrasive and bond.

Tensile strength longitudinally of the Figure 2 structure is 3,200 lbs. per sq. in., while that of Figure 3 is 3,000 lbs. per sq. in. In spite of the porosity of the latter, it compares favorably with that of the former. A wheel of the porous type is extremely fast and cool cutting and is admirably adapted to surfacing high speed and tool steel billets, and also to other operations where high rate of metal removal is economical. Although the examples above made reference to snagging operations, both types of wheels have application in their own field, which are numerous and diversified. Practically an unlimited variation of grinding characteristics can be accomplished by changing the grain size, proportion of abrasive, and molding pressures, as well as by addition of compounding ingredients.

As an example of altering grinding characteristics by compounding: assume a fine grain grinding wheel composed only of rubber, sulphur, and abrasive proved too hard and harsh on a particular operation where a smooth lustrous finish was required. The addition of a small percentage of some ingredient such as stearic acid, for example, to the above mixture, not only would make the wheel act softer or less harsh but would also greatly improve the finish obtained.

(*Continued on page* 60)

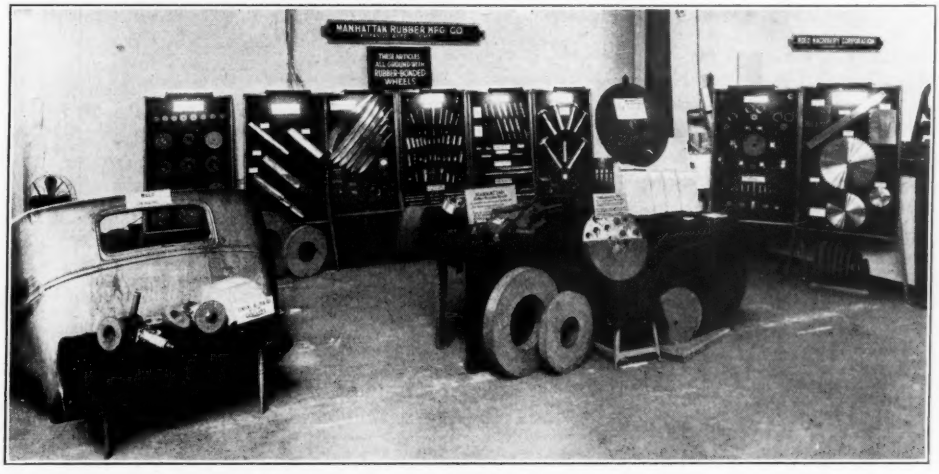


Fig. 4. An Exhibit of Rubber Bonded Grinding Wheels and Articles Ground with Them

Rubber Power Transmission Belting—IV[1]

Physical Properties of Ducks and Belting—Seam and Stiffness Tests—Static Coefficient of Friction — Dressings and Fasteners

W. L. Sturtevant

IN ACTUAL practice a belt is seldom subject to a direct pull up to its ultimate breaking load; nevertheless it is subjected to tension stresses of more or less magnitude. In addition to the quality of the rubber compound the weight, the construction, and the quality of the fabric are important factors in contributing to the strength of a belt and also to its pliability.

It is important in belting manufacture to know the stretch of the fabric as well as its breaking strength. For this purpose a horizontal testing machine is available with an autograph stress-strain chart recorder. To determine the percentage stretch of either warp or filling of a fabric from its charted stress-strain record, as in Figure 1, extend a line through the breaking point parallel to the stress or base line until it intersects the vertical or strain line. The measurement in inches between this intersection and the point where the stress-strain curve leaves the vertical or zero strain line is to be halved because the scale of the chart is double the actual measurement. Since the interval between the jaws of the machine is 3 inches, the halved measurement mentioned must be divided by 3. This result divided by 100 expresses the stretch in percentage.

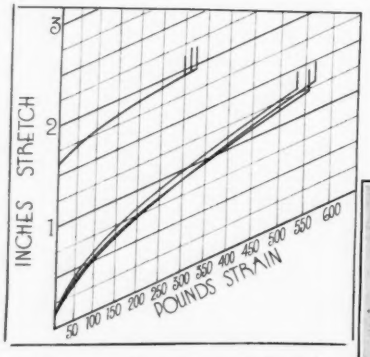


Fig. 1. Strength and Stretch of 32-Ounce Belt Duck

TABLE I

Ducks	28-Oz.	32-Oz.	32.7-Oz.	34.4-Oz.	36-Oz.
Ply	6x5	7x6	7x5	8x5	7x7
Count	24x13	23x14½	31x19	27x18	24x13
Average strength	452x244	550x310	630x330	675x330	610x320
Per cent crimp	22x3	24x4	23x3	23x3	24x4
Thickness, inch	.064	.067	.054	.058	.070

TABLE II

Tensile Strength Pounds Per Inch Per Ply

28-Oz.	32-Oz.	32.7-Oz.	34.4-Oz.	36-Oz.
281	317	327	323	400
291	337	318	336	402
271	315	327	346	419
332	301	302	329	436
299	322	308	328	370
277	294	329	344	361
336	323	344	331	395
299	325	324	326	404
Averages 298	317	322	333	398

The usual weights of duck designed for belt making have the construction and the strength indicated in Table I. The standard A. S. T. M. grab method was used in conducting these tests.

Four-inch four-ply belting was made from these various weights of duck. Their strength per inch, width per ply is shown in Table II.

Physical tests of belting made on the tensile testing machine pictured in Figure 2 were performed according to the specified method of the A. S. T. M.

A. S. T. M. Method of Test

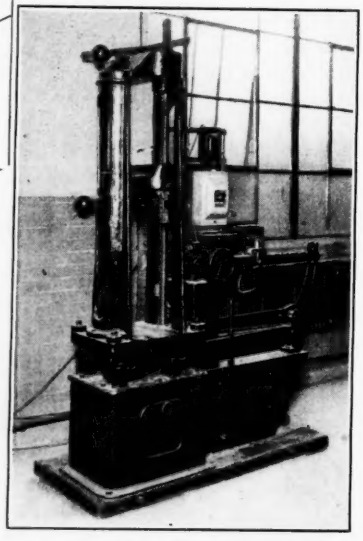


Fig. 2. Belt Testing Machine 20,000-Pound Capacity

The test specimen shall be 20 inches in length, taken the full width and thickness of the belting, up to and including 5 inches; for widths greater than 5 inches, the test specimen shall be cut to a width of 5 inches, parallel to an edge, and beginning ½-inch from one of the edges of the belting. Transverse lines, 10 inches apart, and at equal distances from the ends, shall be marked on the sample, and a record shall be plotted of the stretch in per cent for selected loads per inch per ply. The rate of separation of the jaws shall be approximately 1½ inches to 4 inches per minute. The stretch shall be continued to the breaking point in order to obtain the ultimate tensile strength required. If the sample breaks in the jaws, the test shall be repeated.

Table III records a series of tests made to determine the stretch at various loads per inch per ply of 3 belts made respectively of 32-, 32.7-, and 36-ounce duck. The speed of jaw separation was 1½ inches per minute. It will be noted that the stretch of all the belts at 100 pounds per inch per ply is between 5 and 9 per cent, which is considered good practice for rubber transmission belting.

The data in Table III are shown graphically in Figure 3.

[1] Concluded from INDIA RUBBER WORLD, Dec. 1, 1930, pp. 67-69.

The effect of speed of jaw separation determined on a high grade belting constructed of 32-ounce duck is shown in Table IV. The jaws of the machine were set 12 inches apart for the test.

The increase in indicated strength is appreciable when the jaw speed is changed from 1 inch to 2 inches per minute, but above the latter speed the strength seems to be in equilibrium. Apparently tests conducted within the range allowed by the A. S. T. M. method will give fairly constant results, and a test machine geared to run at any speed within the range specified in that method, can be relied upon to give dependable results.

TABLE IV

Speed per minute of jaw separation ..... *Inches*	1	2	3	4
Tensile strength per in. per ply.. *Pounds*	328	351	343	350

Seam Test

The edges of the fabric on the outside surface of a transmission belt are securely joined by means of a round cord inserted in the seam, which is covered with a thin calendered strip of cover stock. In some instances the cord and the strip are applied in one operation, to eliminate an operation. The efficiency of this seam is determined by the following test, which is the specification beading test of the American Railway Association:

A transverse section of belting 4 inches long shall be cut and, beginning on the seamless side, the plies shall be removed until three remain intact. A line shall be drawn down the middle of the beading, and then on each side of this line, 5/8-inch distant therefrom, two parallel lines shall be scribed. The section shall be inserted in a vise so that the jaws grip the section exactly joining the two outer lines. The vise shall be tightened until the inner surfaces of the doubled section just touch at the top of the vise, and shall be held for 10 minutes. Under this test the beading shall not crack or loosen in the seam.

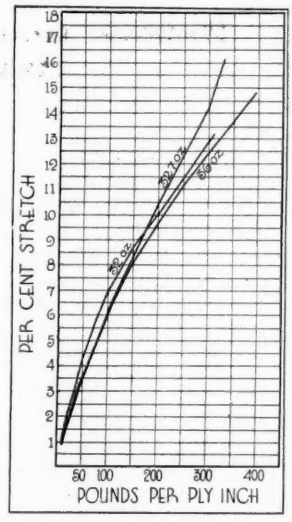


Fig. 3. Stress-Strain Test of Belt Duck

TABLE III

32-Ounce		32.7 Ounce		36-Ounce	
Load in Lbs. /1"/Ply	Stretch in %	Load in Lbs. /1"/Ply	Stretch in %	Load in Lbs. /1"/Ply	Sretch in %
10	1.15	10	1.00	10	.85
20	2.20	20	1.75	20	1.60
30	3.00	30	2.40	30	2.30
40	3.75	40	3.05	40	2.95
50	4.40	50	3.60	50	3.60
75	5.85	75	4.95	75	5.05
100	6.95	100	6.15	100	6.15
150	8.70	150	8.45	150	8.10
200	10.10	200	10.50	200	9.70
250	11.50	250	12.40	250	11.20
300	12.90	300	14.25	300	12.50
Break 310	13.15	325	15.10	350	13.75
		Break 345	16.25	Break 395	14.80

Considerable study has been given to the proper construction and application of rubber compounds for this work, and failure to meet this test in transmission belts is practically unknown.

Stiffness Tests

Tests to indicate the stiffness of a belt are made according to specification No. 101 of the Pullman Co., applying to axle lighting belts for railway use. The belts are 4-ply and are made generally of a special closely woven fabric of hard twisted yarns. The specification follows:

Stiffness Test: A one inch transverse section, full width of belt, shall be placed vertically on a small letter scale and bowed down until outer diameter of semicircle is 3 inches, and weight noted. The test piece shall be bowed down on opposite side in precisely the same manner and weight noted. The sum of these weights shall not be less than 7 pounds.

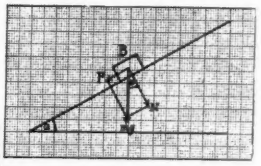


Fig. 4. Diagram of Static Coefficient of Friction

A longitudinal section 1 inch wide and 5 inches in length shall be tested in the same manner, and the sum of these two weights shall not be greater than 6 pounds. Before testing the longitudinal section this section will be limbered by bending back and forth.

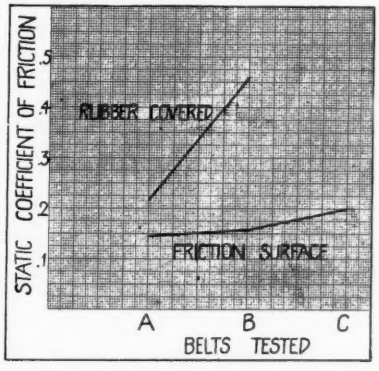


Fig. 5. Comparison of Rubber Covered and Friction Surfaced Belts Compared

Coefficient of Friction

Static coefficient of friction is the ratio that measures the resistance to slippage of one body upon another. It has practical significance in comparing the pulley gripping effect of belting of different types of surface. It can be determined for any material by the use of an inclined plane as explained below. When a body B rests on an inclined plane, Figure 4, the slope of which is gradually increased, there is some angle, a, at which slipping begins.

The weight of the body B is mg and acts vertically. It may be resolved into a component $mg \sin a$, down the plane, and a component $mg \cos a$, perpendicular to the plane. The latter component causes pressure between the surfaces; while the former is the force parallel to the surface which produces motion. From the definition of the coefficient of static friction, $u = \frac{F}{N}$ where u = coefficient of friction, F = the force parallel to the surface, and N = the force normal to the surface. The forces F and N can thus be expressed in terms of the angle of the inclination of the plane:

$$\sin a = \frac{F}{mg} \text{ or } F = mg \sin a$$

$$\cos a = \frac{N}{mg} \text{ or } N = mg \cos a$$

Substituting these values in the first equation

$$u = \frac{F}{N} = \frac{mg \sin a}{mg \cos a} = \tan a$$

The coefficient, therefore, of static friction is equal to the tangent of the angle of repose or inclination at which slippage begins. This relation provides a simple method of measuring u.

As an example of the use of the above method:

A belt conveyer was designed to carry light packages and to run over a decking of polished maple or polished steel. It was necessary to determine the static coefficient of friction on both maple and steel. This was done in the following

manner: Two planes were constructed: one of polished maple, and the other of polished cold rolled steel. Both planes were approximately 3 feet long by 4 inches wide. Test samples 4 by 2 inches were cut from the belt, with the long dimension in the direction of the warp of the fabric, which would be the direction of the belt when in operation. Belting samples, each with a 20-pound weight resting upon it, were placed at the top of the plane. The angle of inclination was increased until the weighted sample moved against the frictional resistance between it and the plane. The tangent of this angle was taken as the coefficient of friction. The curves in Figure 5 show the static coefficient of friction of 3 grades of friction surface, and 2 grades of rubber covered transmission belting, on one of the deck surfaces.

Comparison of the static coefficients of rubber covered and friction surface belts is shown graphically in Figure 5. The results obtained are markedly in favor of the rubber covered belts.

Belt Dressings

Rubber belting does not ordinarily require the use of a dressing. When needed to prevent slippage, the belt is either too loose, overloaded, or the design of the drive is defective. When a belt slips, and it is impossible to stop machines to remedy the condition, a belt dressing may be used very sparingly. At such times a castor oil dressing in liquid or solid form may be used. Belt dressings containing animal, mineral oils, grease, or rosin should be avoided. Besides an analysis of a dressing to determine the presence of these materials, the following test may be made to indicate the effect of the dressing upon the rubber compounds:

Immerse samples of belting in the dressing to be tested and also in castor oil. Thickness and friction tests should be made before and after immersion for 96 hours at 120° F. The swelling test indicates the extent to which the rubber compounds are affected by the dressing, and serves as a check upon the friction test, which indicates how much the strength of the rubber compound has been affected.

Fasteners

Factory built endless belts yield better service than when laced. A rawhide laced spliced belt, however, makes a satisfactory joint when properly made.

In test work as well as field work it is essential that the ends of the belt be cut absolutely square before applying the fasteners. If samples are not properly prepared, results will be seriously affected.

One method of testing the strength of the joint is to pull it apart in a test machine such as used for strength determination. This method is not conclusive, and it is difficult to obtain results that check, for the reason that the test is a straight pull with no flexing action, such as is encountered in service, the fasteners generally pulling out of the belt, the test not indicating the strength of the joint.

It is more satisfactory to test the efficiency of fasteners by means of the life test which is conducted on the dynamometer. Twice a day the belts are examined for possible failures, which might be the breaking of the metal in the fastener itself, the pulling out of the fastener from the fabric, ply separation at the fastener, or breaking of the fabric at, or close to, the fastener. Records are kept showing the life of both the pulling and pulled fastener.

Rubber Bonded Grinding Wheels

(*Continued from page* 57)

To consider a condition contrary to that just mentioned, wherein a great degree of hardness in grade might be required, it is not always practical to accomplish this solely by diminishing the proportion of abrasive to bond. This reduction of cutting material or abrasive below a certain point would produce a wheel of poor cutting qualities, with a tendency to burn itself away. This condition would be apparent by the smoke and the disagreeable odor of burning rubber.

A more satisfactory way of producing a harder grade of wheel is to compound the bond by addition of certain chemicals or fillers, at the same time maintaining higher and more desirable proportions of cutting abrasive. Fillers and chemicals that harden or stiffen the bond are quite numerous. Among common ones used are emery or artificial abrasive flour, iron oxide, zinc oxide, barium sulphate, etc. The above control of bond hardness can be used in either the roll or paddle mixed process. In connection with the former process the addition of certain oils, waxes, or resins to the rubber stock will increase its plasticity and greatly decrease the crushing of the abrasive grains during the mixing operation. Such a mixture produces freer cutting qualities. It is quite apparent that with the various compounding and processing combinations at the command of the rubber bonded grinding wheel manufacturer, it is possible readily to do practically all grinding operations with this type of wheel. An exhibit of rubber bonded grinding wheels is shown in Figure 4.

It is hoped that the foregoing will serve to acquaint the wheel user with the wide adaptability of this product. It is also hoped that the user will have obtained a clearer understanding of the manner in which the grinding characteristics of wheels can be controlled by the producer. Completeness of description of grinding operations to the supplier for his selection of wheel specification, and cooperation in carrying out the manufacturer's recommendations will result in mutual satisfaction and benefit.

Rubber Manufacturers' Association

Meeting and Dinner

THE sixteenth annual meeting of The Rubber Manufacturers' Association, Inc., will be in the West Ballroom of the Hotel Commodore, Lexington Ave. and 42d St., New York, N. Y., beginning at 10:30 a.m., Monday, January 5, 1931.

The regular order of business will begin at 10:30 a.m. A luncheon is to be served at 1:00 p.m. to all in attendance, without charge. Following luncheon, opportunity will be given for discussion of any subjects in which members may be interested. It is the earnest wish of the officers and directors that all firm representatives be on hand promptly at 10:30 a.m. and that everyone stay for lunch and participate in the informal discussion which is to follow.

The thirty-first annual dinner will take place in the Grand Ballroom of the Hotel Commodore, on Monday, January 5, 1931, at 7:00 p.m. Tickets ten dollars. Ladies will be admitted to the balcony boxes which hold six persons, at 9 p.m. Tickets are required and should be applied for on the regular ticket form.

It is especially important that the dinner begin on time. Everyone is therefore urged to be punctual in order that the ballroom may be opened to the guests at 7:00 p.m. sharp.

Cheap Steam Generation for Rubber Plants[1]

THE boiler plant here described is designed along central station lines, and is one of the first to be erected for the operation of a rubber plant.[2] It supersedes an old-type steam plant of seven hand fired boilers burning anthracite screenings mixed with soft coal. The new installation is noteworthy in the following respects: (1) Low cost of steam generation; (2) no fireman required, boiler being operated by turbine engineer; (3) simplicity, enabling operation by ordinary engineers; (4) complete dust and smoke elimination; (5) betterment cost will be retired in two years' operation.

This modern central station type boiler unit, carries the entire power load of the plant; while the old plant is still available in case of breakdown. The reliability of the new boiler is so high that it can be operated singly by the one engineer. Further it is estimated that apart from accidents the new unit can be operated steadily several months at a time, then be shut down over Saturday and Sunday for cleaning, etc. Major repairs such as new refractories, and minor replacements will be cared for during annual inventory shut down.

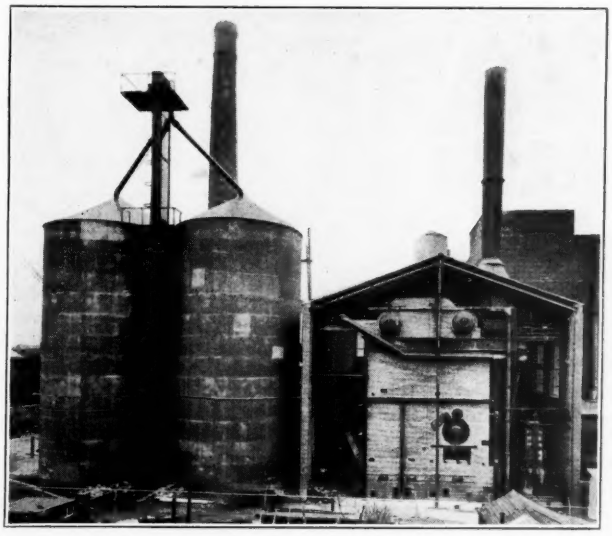


Fig. 1. General View of Coal Storage Silos and Boiler

The plant consists of a 600 h.p. boiler, with furnace and stoker equipment so designed that the boiler can operate at 1,200 h.p. at maximum efficiency, and up to 1,800 h.p. at reduced efficiency. The refractories are designed for a three-year life at 1,200 h.p. At higher ratings than this, not only will the efficiency be lower, but the life of the refractories will be less.

Figure 1 shows the boiler, the boiler house and coal storage silos. Space was reserved in the foreground for future installation of a second boiler. On this side the wall of the boiler house is of temporary sheet-iron construction. This picture shows very clearly how the plant is assembled. In the background is seen the chimney of the old boilers, which are located directly behind the new boiler house. In the right rear is seen the end wall of the main factory; while lower down are the roof and the windows of the turbine room.

The two concrete silos at the left of the boiler room have coal storage capacity for about two months. From the local coal yards screenings are trucked to the plant and dumped directly into a hopper through a grating, shown in the picture between the two silos. The truckman then pushes a button and the bucket elevator picks up the coal, raising and dumping it into either silo, as desired. The silos are provided with a measuring device so that it is possible to know how much coal is in each for the control of operations. To get coal into the boiler fire box, the silo next to the boiler house is equipped near the top with an interior shelf that slopes downward towards the boiler house. From this shelf a chute through the side of the silo carries the coal down into the boiler room. The silo elevator discharges coal on this shelf; and when it is full the coal runs over into the body of the silo for storage. When it is desired to use coal from either silo, a chute is opened at the bottom, and the coal flows down to the front of the elevator. From here it is raised, dumped on the shelf, and delivered to the boiler.

The silo shelf holds three days' supply so that if the elevator should break down, there is ample time for repairs. As the coal comes into the boiler room, it passes through an enclosed scale, visible in the picture half way up the front of the boiler, and thence it drops through a chute into the stoker hopper.

A Coxe stoker of the traveling grate type is used. It consists of a deck of grates carried on sprocket chains at either side, supported in turn on wheels at front and rear. Coal is deposited on this grate from the hopper and is moved slowly towards the rear, burning as it goes, until the ashes fall off the rear end into the ashpit. The ashes are raked at this point into a steam jet ash conveyer, which lifts and carries them horizontally, depositing them in the ash tank, shown in Figure 1 in the upper part of the boiler house at the left. From this tank the ashes slide down through the chute shown left of the boiler room wall in Figure 1, and are loaded into trucks for removal. Thus at no point is there any necessity for man labor in handling the fuel, except where the ashes are raked into the conveyer, is a matter of a couple of hours a day for a yard man.

Figure 2 pictures how the boiler, stack, and other heavy parts are carried by an exterior steel framing altogether independent of brickwork. This allows furnace walls, arches, etc., to expand and contract without putting strains on the boiler proper, and the heavy stack, coal scales, ash bin, and other loads are carried directly to foundation. Being entirely outside of the walls, this framework is never subjected to high temperature.

The boiler is a three-drum bent tube type. The front

[1]Data supplied by Walter Kidde Constructors, Inc., 140 Cedar St., New York, N. Y.

[2]I. B. Kleinert Rubber Co., College Point, Long Island, N. Y.

tubes produce the steam, which disengages in the front drum and passes back through the small tubes at top which dry it before it goes to the turbine. The water circulates through horizontal tubes to the back drum, down to the mud drum, and up again through the steaming tubes where more steam is generated. The boiler is built for 200 pounds' pressure although the working pressure will not exceed 150 pounds. This pressure not only gives an added safety factor but also an insurance life of thirty years.

The vertical section, Figure 3, shows the interior arrangement of the boiler and furnace. The air from forced draft fans comes in under the grate and as gases are evolved from the coal, they are mixed with air in the throat between the two arches, passed up into the combustion space, and burned. The combustion space is very ample so that no flames extend up into the tubes, and thus the deposit of soot and slag on the tubes is avoided. The front wall, where the gases strike as they are driven forward from under the rear arch, is built of individual blocks supported by iron frames so that if any bricks become burned out, they can easily be removed and replaced. The gases then pass through the boiler around the baffles and finally out by the stack.

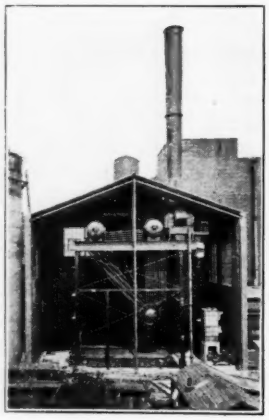


Fig. 2. Boiler Before Bricking In

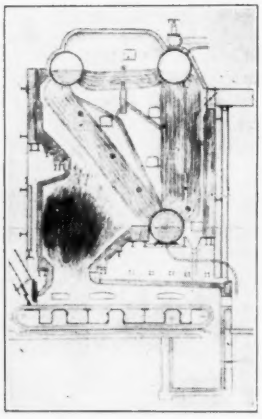


Fig. 3. Vertical Cross-Section of Boiler

The dust-eliminating stack is one of the most interesting features of this plant. It is very important that dust be kept to a minimum, and for this reason a Thermix dust catching stack was installed. The draft is produced in this stack by blowers operated by motor or turbine located in the upper part of the boiler house. These blowers are provided with extended scrolls in which the dust is separated from the gas by centrifugal force and then is passed into the cyclone separators seen below the platform, and thence slides down the pipes into the ash pit. At a test made prior to the installation of this apparatus efficiencies as high as 98 per cent of dust elimination were obtained.

The coal elevator is dust tight from end to end, and the silos are dust tight, together with the chute and the scale going down to the boiler hopper. Thus there is no possibility of dust getting into the air from the coal handling. The ash ejecting system is also dust tight; therefore dust from ashes is confined to the small ash basement at the rear of the boiler. As the ashes are spouted into trucks, they are sprinkled with water to prevent any dust at that point. Dust prevention is further afforded by a hood over the hopper where the trucks are dumped, connecting with the forced draft fans of the boiler, so that dust from the dumping of coal is sucked in and kept out of the air. These various precautions insure a dustless plant.

Ease of operation by the single watch engineer is afforded by the fact that all the apparatus except the stack fans is on one floor. The ash removal is taken care of by the yard man; the engineer has only to order it done at the proper times. The engineer can see conditions at a glance, and all adjustments can be made close at hand. It is seldom necessary for the operator to go anywhere except to the side of the boiler and to the rear where the feed water heater, pumps, etc., are located. This convenience enables him to make his rounds and check the boiler operation the same as he does for the turbine. Occasionally the engineer has to examine the stack fans, and for this he is provided with stairs instead of a ladder. Automatic control is provided to adjust forced draft, stoker speed, and damper so as to take care of sudden variations in load until the engineer reaches the boiler again on his rounds. Feed water is also automatically controlled. All these conveniences make it quite possible for the single engineer to take care of the boiler without difficulty.

Efficiency of combustion is important if low steam cost is to be attained. In this plant it is made easy by the provision of operating guides to the engineer, simple enough in nature and so few in number as to be readily usable, yet giving complete operating data. These instruments are as follows: steam gage, specially illuminated inclined water gage readily readable from the floor, set of draft gages, boiler horsepower meter showing from moment to moment the exact load being carried, combustion indicator giving directly the efficiency of combustion. The indicator is of new and special design giving almost instantaneous indications, so that the engineer can adjust a draft lever, see the indication promptly, and know immediately whether the adjustment is effective or not. In addition to these operating instruments there are coal scales, water meters, and steam flow meters, which give the exact results obtained for the day's run, thus checking the effectiveness of the use of the operating instruments.

The stoker, used in the boiler, and the boiler furnace were designed to burn anthracite screenings without mixing with soft coal, thus eliminating expensive soft coal formerly used. Another large saving is due to the elimination of firemen. Repairs will be lower because of careful furnace design. These savings together with the superior efficiency of the unit have already shown in operation steam cost figures which can be equalled only by the largest central stations. The savings over the old plant in two years will pay for the increased cost of this high grade unit over a new battery of horizontal boilers, after which the saving will be net.

An interesting point in the design of this plant is its compactness. It will be noted that the boiler room is merely a shell fitted around the boiler, and the roof is carried from the boiler frame; thus the cubic contents and cost of the boiler room are kept down. At the same time the space around the boiler is entirely ample for all operating purposes. The elimination of basement except just where ashes are removed is a considerable saving in itself.

The plant is designed for high reliability throughout. There are double fans on the stack, two fans to furnish forced draft for the stoker, double pumps, and piping designed for ready manipulation in case of trouble at any point. Also a complete water treatment system is provided to prevent scale. Reliance must be placed on the stoker as a unit since the only way to duplicate this would be to have a second boiler, but this type of stoker has shown such a high degree of reliability that little trouble is to be apprehended on this score. The design of the furnace has been checked up by a period of operation at extremely high loads, showing that the life of the refractories undoubtedly will be as great as expected, and experience so far indicates that the somewhat unusual plan of relying upon a single unit will prove entirely successful.

"LIQUID RUBBER AND TEXTILES," THE LEADING ARTICLE in this issue, chronicles a new departure in the use of latex in the textile industry, illustrating an important new application of rubber.

Architectural Rubber[1]

Royalite—A New Rubber Product Developed for Floor and Wall Covering

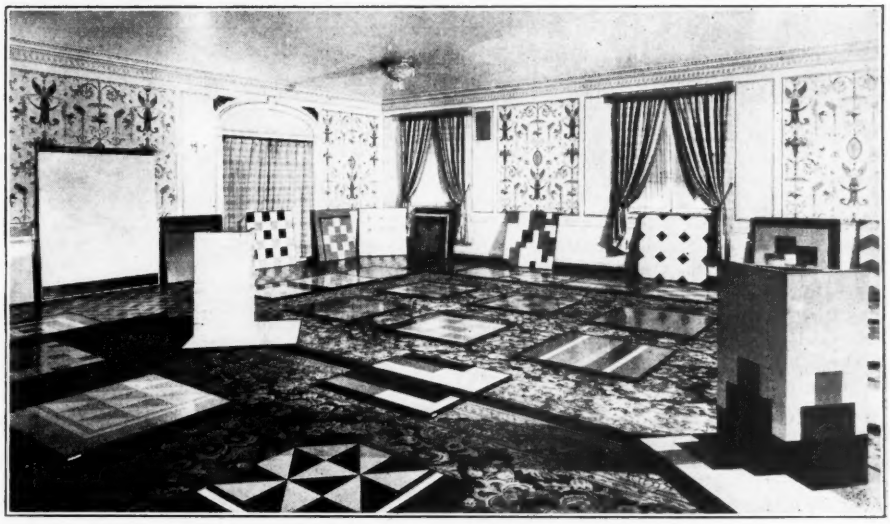


Exhibit of Floor and Wall Applications of Royalite

IN THE many years that rubber has been used for floor covering the possibility of employing it architecturally for decorative covering of floors, walls, and trim was never fully realized until the development of the sheet rubber product known as Royalite or "architectural rubber." The various familiar forms of rubber tiles were made in plain or mottled colors in imitation of wood, marble, or other stone. The new rubber product is distinctly different in many respects from any former rubber floor covering and has more remarkable possibilities than tiling of any sort for the decorative treatment of floors and walls.

Royalite is something quite new. It is not an imitation of any natural material but is characterized by a distinctive quality and texture in a range of thirty-four colors. Thus possibilities of treatment are ready at hand for the master touch of the artist and the skill of the craftsman to bring out very charming decorative effects.

An extended inquiry among the architectural profession in practically every metropolitan center of the United States disclosed a practically universal demand on the part of architects for a new material adapted for use on both floors and walls, in limitless colors and designs and at the same time eliminate the base line around the floor limits. In other words join the floors and walls in such a manner that the base line becomes less assertive and the floor appears to merge into the wall. This gives a room or a passage the aspect of greater width.

The visual aspect of size or area is a fascinating study and one in which all architects seem at present to be interested. For example when an architect plans a modern office building, he has no advance information on how the various spaces on any floors will be divided to suit prospective tenants. As a result the architect is greatly handicapped in planning the interiors; neither does he know how the interiors will be specified by the tenants. About all he can do, consequently is design a loft building with adequate elevator equipment, and the building is well advanced toward completion before many of the corridors and interior spaces are definitely decided upon. The architect, therefore, needs a material which can be quickly adapted to change of plans, can be quickly delivered by the manufacturer, and conveniently installed. In short he is seeking a flexible medium.

The value of any material is gaged some degree by its natural limitations. Marble, for example, is limited to the colors available in various quarries of the world. Wood is limited both in color and texture. Such materials are not only expensive but must be ordered and planned for months in advance of installation. Royalite is without any limit as to color and is a soft resilient material which withstands abrasion and is easily available, easy to install, and of exceptionally long life. In the form of sheets it is available in thicknesses of $\frac{1}{4}$-, $\frac{3}{16}$-, and $\frac{3}{8}$-inch and a range of thirty-four permanent color harmonies displaying the softest and most artistic effects. The texture of the material is singular and unlike anything hitherto offered for architectural purposes. The composition has sufficient rubber content to give pliability and resiliency and contains no reclaim or fibrous material in its make-up. The colors used are strictly non-fading pure mineral pigments. The product is attached to wood, concrete, or any smooth, hard dry surface by means of a pigmented special cement distinctly unlike ordinary rubber cement.

While it is quite impossible to reproduce pictorially the colors and the texture of this unique architectural rubber product, the illustrations shown suggest in black and white one or two modernistic designs, the possibilities of which are practically without end, and the success with which floor and wall may be made to blend and eliminate the visibility of the meeting place.

[1]Data and illustrations from the United States Rubber Co., 1790 Broadway, New York, N. Y.

Business Staging Come-Back

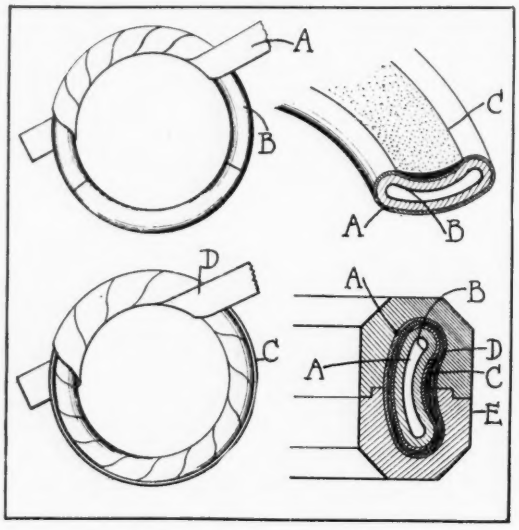
On the basis of surveys made by a leading business research institute in a wide range of industries, it is declared that the foundation of American business is absolutely sound. Conceding a lull in demand, the fact remains, says the report, that consumption does not drop off so rapidly as production; conversely production lags in resumption considerably after consumption increases. Hence the result is shortage. It urges that advertising be continued for stimulating trade and states that the more progressive companies are planning for increased advertising. Nothing, says the report, can long delay a general revival.

Making Self-Sealing Tubes

Joseph Rossman, Ph.D.

NOTHING exasperates a motorist more than a flat tire. Motor cars have reached a high state of mechanical perfection so that we seldom see the motor tourist on the road tinkering with the machinery. Automobile trouble, today, usually means tube trouble. A small tack, a nail, or other sharp object penetrating the tire carcass enters the tube, and immediately the mischief is done with the escape of the imprisoned air in the tube.

In order to prevent the escape of air when a tube has been pierced by some object, our inventors have devised the self-sealing or so-called puncture-proof tube. The fundamental principle involved is to provide the tube with a layer or a composition which will automatically seal up any punctures and thus prevent the escape of air. This is an interesting problem.



United States Patent No. 1,527,720

One of the earliest expedients used consisted in applying a layer of rubber under compression to the tube. When this layer is punctured, the compressed rubber will expand sufficiently to seal the puncture. Many methods have been patented which have utilized this simple and effective principle. John Palmer, the inventor of weftless fabric, was one of the first inventors to apply this principle to bicycle tires in 1892. According to his U. S. Patent No. 467,642 June 26, 1892, a layer of fabric is first applied to a mandrel. A strip of rubber is then applied to the fabric, and the assembly is then turned inside out, placing the rubber under compression.

In a recent U. S. Patent No. 1,709,797, April 16, 1929, to Kuhlke, a layer of rubber for forming the puncture-proof element of the tube is first prepared from a suitable composition which will cure at a different temperature and a longer cure than the tube of which it will become a part and which, when compressed, will be self-healing. This strip is formed in a ring about a ring core which is somewhat larger than the diameter of the finished tube. The ring of rubber in cross section is crescent shape, tapering down to thin feather edges. To increase the compression feature of the rubber the strip is provided with a layer of cords laid back and forth across the central portion of the compression strip in undulating or ogee curves. The vulcanized compression layer is turned inside out so that the inner surface becomes the outer surface, and the inner portion of the rubber is compressed to afford a self-sealing structure in case of a puncture. To construct a tube incorporating the compression layer, the outer surface layer is buffed and cemented, and a layer of unvulcanized rubber is applied to the central region of the compression layer. This rubber is compounded to cure in a short time and is of a composition to form the outer wall of the inner tube.

The second principle in making self-sealing tubes consists in building a tube having a layer composed of some special material such as raw gum or a sticky composition which will seal any punctures. William W. Wildman has obtained several patents for making tubes of this nature. His U. S. Patent No. 1,527,720, Feb. 24, 1925, for instance, makes a tube as follows: As shown in the accompanying illustration, the first step consists in applying a thin strip of rubber *A* compounded with sulphur, upon a collapsible circular core *B* which is concave-convex in cross section to permit a kidney-shaped tube to be built up and molded thereon. Strip *A* may be applied in various ways to the core *B* so as to envelop it snugly and completely, using a hand roller to press and shape the rubber to the core, and is shown in the picture as being wrapped spirally around the core to form an endless tube eventually.

Upon the completion of this first step a second strip *C* of raw rubber without sulphur or other vulcanizing substance is placed circumferentially within the concaved side of the wrapped core; this strip is preferably graduated or tapered in thickness at each side of its longitudinal central portion to create a thicker or heavier central circumferential portion for the tube. For example, strip *C* may be approximately ¼-inch thick at its center and taper to about ⅛-inch at each edge. A third strip *D* of rubber containing sulphur is wrapped around the other two strips, either circumferentially or spirally; and this third strip may be twice as thick as the first strip, or of approximately the same thickness and wrapped with a plural number of folds, to provide a thicker and heavier vulcanizable layer upon the outside of the tube than upon its inside. The kidney-shaped core with its correspondingly shaped wrapping is then placed within a separable mold *E* and subjected to heat and pressure within a vulcanizing press until the vulcanizable portions of the tube have been cured.

The tube and the core are then removed from the mold and the tube severed transversely to permit it to be stripped from the sectional core. The usual air valve then is affixed and the severed or cut places spliced or united together in any suitable way. The finished tube is endless or ring-shaped and is of kidney shape in cross section so that the interlayer of unvulcanized viscous rubber will be placed in a state of compression between the outer and the inner elastic portions of the tube when the tube is inflated with air and stretched and expanded to fit the tire casing. In inflating the tube the concaved circumference is pressed outwardly and becomes convex so that if the tube is cut or punctured by nails or other elements forced through the tread of the tire casing, the raw gum will seal and close the punctured place.

(*To be continued*)

IN 1929 WAGES IN THE UNITED STATES WERE 3½ TIMES those in Belgium; yet manufacturing costs in the United States were only 39 per cent higher. In 1929 wages in the United States were 83 per cent higher than in England; yet manufacturing costs were 2 per cent lower.

Junior Talks

—about NIPPLES

MUMMY often says to Daddy, "Hush! Little pitchers have big ears."

Then one time I found out what she meant. (But I don't think my ears are so big; do you?) Anyway, by listening I learned all about something that means a whole lot to me—nipples.

The other day Mummy and I were visitin' Buddy: he's my frien'. His mother was fixin' his bottle while Mummy watched.

"Why, Cleo!" she exclaimed. (I hope I say all these big words right.) "I had no idea you were so old-fashioned."

"Old-fashioned?" Buddy's mother was quite surprised. (And I grinned at Buddy 'cause he always claims his mummy is better than mine.)

"Certainly, my dear. Just look at that nipple. It's positively prehistoric! And it has only one hole on top. The kind the doctor recommended for Junior has three.

"What good is that? Look at Buddy's mouth, then Junior's. Buddy's is all puckered. Poor child, he has to struggle so when drinking his milk. But the milk flows out easily through three holes. They also keep the nipple from sticking together. Still more important, they prevent causes of colic and other disorders from improper feeding.

"Here! I'll show you something else," Mummy continued as she came over to take the bottle I had just finished.

She was quite excited now for she is so keen about children and anything that affects us. (I guess that's why I won the "Perfect Baby" prize this summer.) Mummy took the nipple by its little tab and eased it from my bottle.

"Examine that," she said as she handed it to her frien'. "This nipple has no inside ribs to collect food. Feel that rubber. It's very durable and much heavier than that in Buddy's nipples. Look at this ball-shaped top. It enables Junior to get a firm hold on the nipple so it won't always be slipping from his mouth, which, consequently, never gets sore. But you know the trouble you had last week with Buddy."

"Really, Grace, you're a wonder. You ought to be selling nipples."

"Selling nipples!" Mummy's dimples danced. "I guess I will. As soon as I've finished, we're going to my druggist to buy Buddy some decent nipples."

"Certainly," agreed Buddy's mother. "But what's this tab for?"

"Oh! That facilitates putting on or taking off the nipple without contaminating its inside or the lip of the nursing bottle, through contact with fingers. And merely by slightly pulling the tab outward I let air into the bottle when necessary, without even removing the nipple from Junior's mouth.

"Even bottle tops are made with a similar tab. After I prepare Junior's formula, I cover each of his bottles with a small sized cap. All I do later is remove the cap by the tab and place the nipple on by its tab—and nothing is contaminated. I use the large caps for milk and cream bottles. These caps are a blessing, Cleo. They keep Junior's food free from impurities, for the cap closes not only the opening of the bottle but also protects its rim from dust and germs. I can put the bottles anywhere in any position—in the refrigerator, Junior's carriage, even the car, and the bottle won't leak."

So after Buddy and I were cleaned, we went to Mr. Mac's store.

"Good afternoon," he smiled.

"Good afternoon, Mr. Mac. We want some nipples." Mummy told him.

"What color?"

Buddy's mother was puzzled as she looked at the pretty blue and bronze box full of nipples on the counter.

"Does it make any difference?" she asked.

Mummy laughed. "Oh, Mr. Mac, she has so much to learn about these nipples. I've been telling her a bit, but I'm sure you know much more that she ought to hear about them."

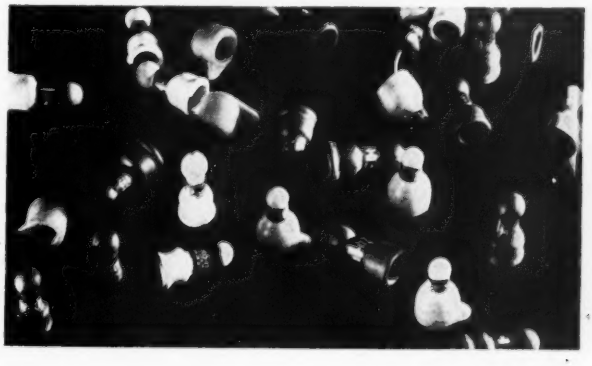
Mr. Mac is very obligin'. He picked up a small black nipple.

"Now, this," he began, "is for babies up to four months. Since your child is older, he should use the regular size, which comes in three colors: pure gum black, red, and white.

"You asked before if color makes any difference. It really doesn't, although we recommend black. It's amusing, however, about the other colors. Down South white is a great favorite. I suppose the pickaninnies like it better. But in foreign sections red is most popular. Well, you know how foreigners always are attracted to gay colors."

But Buddy's mother, rememberin' all Mummy had said, declared, "I think I prefer these amber nipples with the cute little tabs. And I want some bottle caps, please."

The druggist got some. "A trained nurse invented these. They are very simple to use," he explained. "Just wet the inside of the cap, and it slips on easily. Before using a new cap, of course, cleanse it thoroughly and then sterilize it by boiling it for only one minute or by pouring boiling water over it. A used cap, before being put on a fresh bottle, should be thoroughly cleansed as should be the top rim and the lip of the bottle. After you remove the paper disk



from the bottle, hold the latter by the neck with your left hand; then place this inner bead of the cap under the top ring of the bottle, holding it there firmly with the first finger of your left hand. Next, take hold of the tab with your right hand and pull the cap over the bottle top. To remove the rubber cap you secure the neck of the bottle with your left hand and press your first finger against the back end or on top of the cap; then merely pull up the tab, and off comes the cap. Don't try to stretch the cap over the bottle with your fingers inside the cap as such a practice is unsanitary. Besides you may upset the bottle.

"These caps, like the nipples, are of pure gum and may be sterilized by boiling. When the cap is not in use, keep it in a glass or a cup of water to which a pinch of borax may be added. Thus the cap is kept clean, and the rubber preserved.

"Similar treatment is recommended for nipples," Mr. Mac continued. "After the nipple has been used, wash it carefully, boil it for a minute or two, and then store it away for future use, in a dry sterilized dish.

"Have you any questions?" he concluded.

"Gracious, no!" exclaimed Buddy's mother. "I believe I understand everything perfectly now. Thank you both so much."

Thus Buddy came to use nipples like I do.

But I'm not finished yet.

Last night we had company, friends of Daddy's—Raymond J. Fries, sales manager of the Davol Rubber Co. in Providence, R. I., and his assitant, Walter L. Davol. I think they're awful nice. Why? Well, listen.

Of course I was put to bed long before they arrived. I knew they were comin', though, 'cause I heard Daddy tellin' Mummy about them. Anyway, I was just dozin' off when I heard voices as the nursery door opened very gently.

"Hush!" whispered Mummy. "I think Junior's asleep."

So I closed my eyes very hard and pretended I was.

They leaned over my crib and looked at me.

"Gee! He's a great kid. You must be very proud of him," said one of the men.

"I'll tell the world we are," answered Daddy.

"What's he going to be when he grows up?" asked the other man.

"Quarterback at Notre Dame," Daddy promptly replied, and they all began to cheer.

"Hush!" whispered Mummy again as she bent over to tuck me in and pick up my empty bottle.

Mr. Fries, at least I think it was, noticed the nipple.

"Why," he was very pleased, "that's one of our Anti-Colic nipples."

"Certainly," said Mummy. "I have the bottle caps also. I wouldn't use anything else."

"You're quite enthusiastic," remarked Mr. Davol. "You should join our sales force."

Mummy laughed. "I did, in a way, last week," and she told them about Buddy.

Daddy was so proud when those men complimented Mummy. But he pretended to be very gruff.

"This woman takes more interest in her child than in her poor neglected husband." (I know he was only foolin' 'cause I have eyes as well as ears.)

"In that case," said Mr. Fries, "perhaps you'd like to hear how our nipples are made."

"I'd love to," came from Mummy. "But I think we'd better go outside. We might disturb Junior. Still, I think I'll leave the door partly open in case he wakes up and wants something."

The following is what I heard. I hope I get all the words straight, for some of them are rather strange.

"We make our Anti-Colic nipples in three sizes. No. 137, petite, is of pure black gum. The nipple of medium size comes in three colors: No. 147, pure black gum; No. 146, red; and No. 140, white. The Jumbo size, No. 157, is a large black nipple.

"In manufacturing nipples we sheet the rubber stock on a calender, and, with a die, cut blanks from the rubber. These blanks, two for each nipple, since each blank represents a half-nipple, are cemented on the edges and seamed together. Then we cement the open end of the unvulcanized blanks and roll the stock inwardly to put this roll on the inside base of the nipple. This position of the rolled edge gives the nipple better clinging power.

"After the blanks are seamed and rolled, we put them on metal forms and send them to steam vulcanizers, where the cure or vulcanization takes place. When they come out, they are stripped from the forms; the three holes on top are punched; and the nipples are washed and inspected. Next, our trade mark is placed on each nipple; then they are packed and ready for shipment.

"Specially designed and patented machines developed in our own plant do cutting, cementing, seaming, punching, and banding.

"We make also a molded amber colored Anti-Colic nipple. It is press made and seamless. The Sani-Tab nipple, of course, is of special patented design.

"The pure Ceylon, light colored rubber in a solid cord is run on a tubing machine. The rubber is cut in proper lengths and put into the cavity of the mold. The upper section of this two-plate mold containing the cores, which form the inside of the nipple, is placed on the bottom plate. Hydraulic pressure forces the plates together, and thus the nipple is formed. Vulcanization occurs in the hydraulic press to which steam is applied for the required time and temperature. Removed from the mold, the nipples are trimmed on a machine, washed, punched by a machine, banded, and packed ready for shipment."

Mr. Fries, or maybe it was Mr. Davol, then repeated some things Mr. Mac had mentioned.

After a while Daddy began to discuss Big Business and stocks and bonds. I didn't pay much 'tention. Besides I heard the Sandman comin' . . .

Faultless Leads the Way

With Clever Novelties That Pay

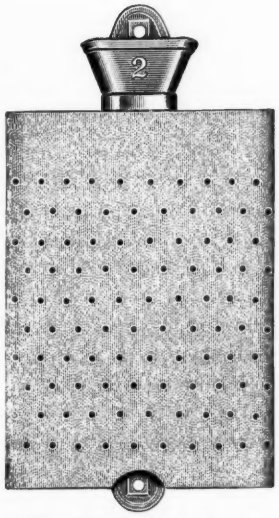
COMMODORE VANDERBILT signified, "The public be damned!" Modern merchandising, however, disagrees. Now resounds. "The public be pleased"—and how!

To satisfy the wants of this public manufacturers are on the alert to discover and even create new commodities. The greater the needs these goods fill, the larger will be the manufacturer's profit, the more increased his sales.

In witness whereof consider the experience of one rubber company[1] that showed ingenuity and profited thereby.

Last year when the wolf began selecting choice doorways, this concern decided to fool the beast. So Opportunity, not the *Canus occidentalis,* won admittance.

The company, manufacturing druggists' sundries and meeting keen competition, exercised its gray matter and offered women, greater part of the purchasing public, convenient and attractive specialties: Kumfy covers for nursing and hot water bottles.



No. 140 Kumfy Cover

Every mother realizes the trials of a nursing bottle. Playful baby would decorate the landscape. The result—spattered floors and furniture, shattered glass; more cleaning for Mother. Besides anyone will tell you broken glass is not good for creeping babies—not to mention pacing adults. Sometimes the child is not playful, but merely unable to hold the slippery nurser. Results, nevertheless, are the same. A cloth around the bottle will not remove danger of slippage. In fact it makes a bulkier bundle for tiny hands. Since, furthermore, glass is a good conductor of heat, the contents of the bottle rapidly cool.

No. 110, for Narrow-Neck Nursers

But Kumfy Cover ends such troubles. It insures Baby's firm grip on the bottle and prevents it from rolling and breaking. More important still, the cover keeps the food warm.

This velvety pink or blue sponge rubber cover comes in two sizes: No. 110 for narrow-neck nursers, and No. 125 for wide-mouth ones. Seven holes on each side of the cover make visible the milk in the bottle.

The other blessing in disguise is a cover for hot water bottles.

Do you ever despair of getting for a long time enough, but not too much, heat from your hot water bottle? For if at first the water is just right, the bottle soon cools and needs refilling. Or if the water is too hot, you wrap a towel around the bottle, a hand towel letting too much heat through, or a heavy towel letting too little. Both are clumsy and difficult to keep in place. Yes? Then you will appreciate this cover.

Fill the bottle from one-half to two-thirds with water hotter than ordinarily used. The cover makes possible such hot water without burning or blistering yourself. Do not, though, exceed a temperature of 180° F.; otherwise you run the risk of generating steam and bursting the bottle.

Be sure first to fill the bottle and screw in the stopple before inserting the former into the cover. To make the bottle more secure slip its neck under the convenient band inside the cover.

The latter permits holding a bottle radiating greater heat, and eliminates the towel. The cover tempers the first heat and acts as an insulator, preventing quick cooling and keeping the bottle warm long after an unprotected one would be cold and comfortless.

The velvety feel of the sponge rubber, moreover, doubles the comfort obtained from your hot water bottle because the sponge rubber is so much more soothing and comfortable than an uncovered bottle.

This specialty makes a water bottle equally serviceable for either dry or moist heat and dry or wet cold compresses. When moist heat is desired, immerse the cover in hot water and wring it out thoroughly with your hands before inserting the bottle two-thirds full of hot water. Use a dry cover for dry heat.

For a cold compress wet the cover in cold water; then wring it out. Next insert the bottle two-thirds full of cold water and finely chopped ice. For a dry cold compress be sure to keep the cover dry.

These covers also are of perforated sponge rubber. Two sizes are available: No. 140 for standard two-quart bottles, and No. 190 for the oversize bottle. The colors of these covers are designed to match the hues of the hot water bottles; natural, red, orchid, blue, and green.

Kumfy Covers, both for nursers and water bottles, can be sterilized frequently in boiling water. They are packed in neat boxes. That for the nursing bottle cover vividly pictures a colorful array of toys, sure to catch the eye of any possible buyer.

No. 125, for Wide-Mouth Nursers

Experience, you know, is a great teacher.

[1] Data and illustrations from The Faultless Rubber Co., Ashland, O.

Domestic Renewal Sales of Automobile Casings

E. G. Holt[1]

THE following excerpts conclude and summarize a study[2] on tire production and domestic renewal sales.

In order to provide necessary basic data, the method followed was to (a) establish as closely as possible the annual production of automobile casings, (b) reduce this by subtracting annual exports, (c) further reduce by the number of casings used for original equipment on new automobiles, (d) adjust the figures for changes in manufacturers year-end inventories of casings, and (e) add the number of casings imported. In estimating registrations of pneumatic tire vehicles, allowance has been made for registrations of vehicles equipped with solid tires.

Tire Renewal Sales Per Car

It is customary to estimate tire renewals per car by dividing the renewal sales for a given year by the registrations one year or two years previous. In the following statement, registrations two years previous are taken as the divisor, since cars manufactured and sold during recent years require few tire renewals during their first year of operation under current conditions, although during the early years of the period covered this was not the case.

The statement shows the estimated total annual registrations of pneumatic-tired cars and trucks, the estimated domestic renewal sales of casings, and the average renewal sales per vehicle, as well as the annual changes in average renewal sales per car both in volume and in percentage of the rate for the preceding year.

ESTIMATED TIRE RENEWAL SALES PER CAR

Year	Registrations of Pneumatic-Tired Automobiles	Year	Renewal Sales: No. of Automobile Casings	Renewal Sales: Average Per Car Casings	Change: Tires	Change: Per Cent
1908	194,400	1910	1,525,000	7.84	.....	.....
1909	305,950	1911	2,030,724	6.64	—1.20	—15.3
1910	458,500	1912	2,971,000	6.48	— .16	— 2.4
1911	619,500	1913	4,022,000	6.50	+ .02	+ 0.3
1912	902,600	1914	6,007,655	6.65	+ .15	+ 2.3
1913	1,194,262	1915	7,871,280	6.59	— .06	— 0.9
1914	1,625,739	1916	10,781,793	6.63	+ .04	+ 0.6
1915	2,309,666	1917	16,753,881	7.26	+ .63	+ 9.6
1916	3,314,538	1918	19,493,556	5.88	—1.38	—18.5
1917	4,702,830	1919	23,549,393	5.01	— .87	—14.8
1918	5,726,990	1920	20,771,184	3.65	—1.36	—27.6
1919	7,012,602	1921	22,127,180	3.16	— .49	—12.8
1920	8,555,262	1922	28,723,270	3.36	+ .20	+ 6.3
1921	9,755,804	1923	38,587,939	2.93	— .43	—12.9
1922	11,518,880	1924	34,425,454	2.99	+ .06	+ 2.0
1923	14,346,058	1925	40,107,257	2.80	— .19	— 6.6
1924	16,861,814	1926	40,035,270	2.38	— .42	—15.3
1925	19,291,428	1927	47,864,927	2.48	+ .10	+ 4.2
1926	21,442,110	1928	53,560,249	2.50	+ .01	+ 0.4
1927	22,677,488	1929	47,052,696	2.11	— .39	—15.6
1928	24,060,204	1930	*40,000,000	1.65	— .45	—21.3
1929	26,105,183	....	.....	....	.....	.....

*Maximum estimate.

The indicated renewal sales per car averaged between 6.50 and 7.00 casings yearly from 1910 to 1917. In 1918 this rate began a long decline which continued through 1921, or four successive years, reaching a low for the last year of 3.16 casings per car. In 1922 the rate recovered to 3.36, an increase of 6.3 per cent. This was followed by another year of decline to 2.93, a recovery of 2 per cent to 2.99, two more years of decline to 2.38, subsequent recoveries of 4.2 per cent in 1927, and of 0.4 per cent in 1928, and a decline of 15.6 per cent to 2.11 in 1929.

From records thus far available for 1930, it appears that 40,000,000 casings sold for renewals will be a maximum figure, and on that basis the 1930 renewals per car would work out at 1.66, a decline of 21.3 per cent from 1929. The general tendency has been steadily downward since 1917, and while there have been temporary increases in the rate of renewal sales per car, these increases have tended to become smaller during the period. The increase in 1917 over 1916 was 9.6 per cent; in 1922 over 1921 it was 6.3 per cent; in 1924, 2.0 per cent; in 1927 and 1928 over 1926, just under 5 per cent. It would seem that an increase of 10 per cent in the rate would be a high maximum to anticipate for any particular year, based on this past record.

For successive declines equivalent to those of 1929 and 1930, it is necessary to look back to the period of 1918-1921, and for the possibilities of recovery, it is necessary to study years subsequent to 1921.

There have been changes in trade practices during the period which influence the indicated renewal sales per car figures. In the earlier years motorists did not so often buy new cars equipped with spare tires, and the more recent practice of supplying one or two spares with new cars tends to anticipate normal renewals. By allowing only four tires per car for original equipment throughout this study and figuring all spare tires as renewals, the indicated renewal figures are made higher than actual renewal sales, especially in years of abnormally high automobile production.

That tire renewal sales are influenced by general business conditions is an axiom that probably everybody will accept. But it is noteworthy that renewals per car began to decline in the boom post-war years, that they showed no marked increase in the boom year of 1925, and that they declined in 1929 in advance of general business. There is some evidence that renewal sales of tires move up and down in advance of general business.

It is frequently said that tire renewal sales are usually excellent in years of low automobile production. This seems to be borne out for 1924 and 1927, but not for 1918, 1921, and 1930; perhaps in 1930 motorists have been wearing out spare tires to an unusual degree, and perhaps they started the year with tires in condition much above average; that motorists were in possession of an unusually high ratio of spares is hardly indicated by the declining renewal sales rate in 1929, and dealers' stocks at the end of 1929 were not considered excessive.

Types of Tires Produced

The explanation for the constantly reduced rate of renewals in the past twelve years is, it is believed, to be found in the changes and improvements in tire construction, and while business conditions are, of course, reflected in tire renewal sales, the changes in types of tires have over the period been of much more importance. Improved roads have also been a factor, but they have brought higher spreads, and more frequent braking is necessitated by the growing use of traffic lights in cities; these factors tend to offset road improvements.

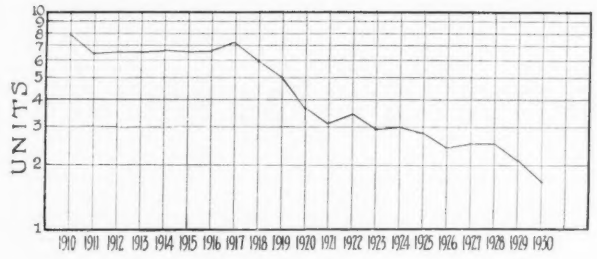
The demand of consumers for tires of high quality, and the competition of manufacturers for business to keep their plants as near capacity output as possible, have operated to prevent anything like stability in tire design. Inventive genius has constantly improved tire quality, often without full realization of its ultimate effect on future renewal sales; in any case this effect could not be accurately measured in advance. Quality, and still greater quality, seems to be the keynote of success in selling tire transportation; it is generally regarded as more effective than advertising.

In the following table there are statistics representing the approximate percentages of automobile casings of different construction, divided as to rim type between clinchers and straight sides, and divided as to construction between fabrics, high pressure cords, and balloon tires, with six and eight-ply passenger car balloons shown separately.

The percentages from 1921 to 1929 are based on production figures issued by the Rubber Manufacturers Association. For years

[1]Chief, Rubber Division, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.

[2]Special Circular No. 2865, Rubber Division.



Estimated Tire Renewal Sales in Units Per Car

prior to 1921 they are estimates based on a study of tire equipment of cars and trucks from 1915 on as reported in 1922-1924 editions of the *Tire Rate Book* on information gathered from members of the trade, and on examination of trade paper files, including the INDIA RUBBER WORLD, the *India Rubber and Tire Review*, *The Rubber Age*, and *Tires*.

The statistics are believed to be reasonably representative of the trend of tire design, and are presented for want of more exact information concerning production of tires by types, to explain the reasons back of the constant decline in renewal sales. The percentages may be applied to statistics of total production of casings to estimate the approximate unit production of the different types of casings.

PRODUCTION OF AUTOMOBILE CASINGS BY TYPES—PERCENTAGES

	Rims		Construction			
	Clincher	Straight Sides	Fabrics	H. P. Cords	Balloons	6 and 8 Ply
1910	98.0	2.0	100	0	0	0
1911	96.7	3.3	100	0	0	0
1912	93.0	6.0	99	1	0	0
1913	91.0	9.0	98	2	0	0
1914	90.0	10.0	97	3	0	0
1915	89.0	11.0	95	5	0	0
1916	87.5	12.5	92	8	0	0
1917	85.0	15.0	90	10	0	0
1918	80.0	20.0	85	15	0	0
1919	75.0	25.0	75	25	0	0
1920	70.0	30.0	65	35	0	0
1921	65.0	35.0	60	40	0	0
1922	58.8	41.2	51.4	48.6	0	0
1923	61.0	39.0	42.6	55.4	2.0	0
1924	57.2	42.8	29.7	58.8	11.5	0
1925	50.8	49.2	14.1	51.8	34.1	0
1926	40.7	59.3	5.3	47.2	42.5	5
1927	28.6	71.4	1.5	44.6	45.9	8
1928	19.6	80.4	0.6	33.0	53.8	12.6
1929	12.7	87.3	..	25.1	58.0	16.9

The overwhelming majority of the tires produced from 1910 to 1915 were fabric clincher tires. Some of the leading manufacturers first carried so common a size as the 32 by 4 straight side cord in their price lists in 1913. Most of the early straight sides were fabric tires, and while the percentage of total output consisting of fabrics has constantly declined, it finally passed out of production only in 1929.

By 1917 straight side tires and cord tires had reached a point of real importance in the trade, and the decline in tire renewals per car which began in 1918 was from this cause as well as from Government-urged conservation. As these types of tires increased in relative importance at the expense of clincher and fabric tires, tire renewals continued to decline. The clincher tire remained an important factor until 1926, owing to its continued use as equipment on Model T Fords, but it is now rapidly disappearing.

Cord tires had just assumed a dominating position in total tire production in 1922 when balloon tires were introduced. The percentage shown for balloons covers also the early balloon type or semi-balloon tires for standard rims, which were of importance in 1923 and 1924. The effect of balloon tires on renewal sales was not immediately apparent; many troubles were experienced with the first balloons, and it was at first thought that while they gave more driving comfort, they were less durable than high pressure cords. Results as shown by 1929 and 1930 tire renewals do not indicate this was a sound conclusion. Only in 1927 did balloon tires reach over 50 per cent of total production, and two years later renewal sales began their present decline.

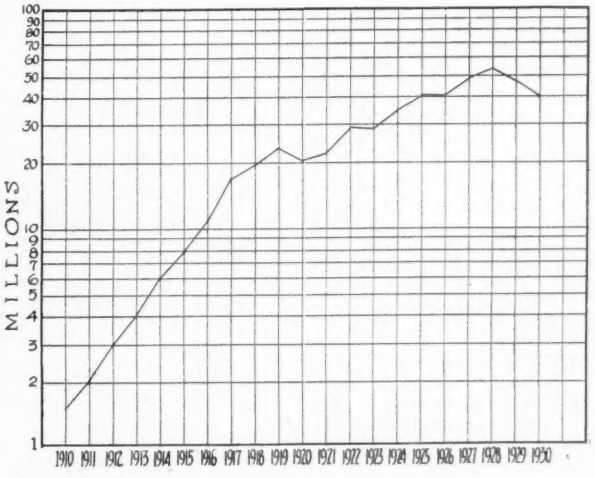
With the increasing production of six and eight-ply passenger car balloons, it seems not unlikely that tire life may be further increased. This class of tires is the only one to show a numerical increase in production in 1930 and its increase in 1929 was at a more rapid rate than for other balloon tires. So long as the percentage of total output credited to so-called super-quality tires continues to increase there is no great likelihood that the rate of tire renewals will also increase, over a period of years.

It is worthy of remark that the tendency of the public toward quality tires seems to be accentuated in times of business depression, at any rate when prices of tires are low. When prices are high, as in 1925 and 1926, the natural tendency would be to economize and postpone buying, or buy a cheaper product. It was probably because of this that tires of sub-standard quality were developed during the period of rubber export restriction, and high prices for rubber. During 1925, 1926, and 1927, there was a tendency towards the increased use of reclaimed rubber in tires. Leading tire manufacturers produced as many as four different qualities of tires, those of lower grade being generally spoken of as second-line, third-line, etc. Since 1927 the trend has been away from tires of lower than standard quality towards tires above standard quality, and the percentage use of reclaimed rubber in relation to crude rubber in the domestic industry has dropped from 50 in 1928 to 45 in 1929, and to 40 in the first half of 1930; further decline in the use of reclaims is anticipated as a result of the low price of crude rubber.

The question is whether subnormal buying of tires in 1930 has brought tire renewal sales per car to a lower point than they will average in future. Each low point registered during the past twelve years has been succeeded by one still lower; there was only a 6 per cent recovery in 1922 as compared to 1921, after four years of declining renewals per car. If the past is accepted as a guide, perhaps we have not yet reached the minimum figure of renewal tires that may be attained if super-quality tires continue to increase in popularity. Most of the six and eight-ply tires have reached consumers as renewals, and if they should be generally adopted as original equipment by automobile manufacturers we might approach even more closely that millennium at which tires would last the life of the car.

The trend of renewal business in units per vehicle, if illustrated in a chart covering the period since 1920, may be used by those who must forecast renewal business to indicate possibilities for future years, but in so doing, one should bear in mind the rule that it is not safe to extend a trend line more than one-tenth of the distance for which the original line is drawn. While the trend line for the period since 1920 has been steadily downward, the probability is that renewals will sometime reach a level where they will change little from year to year—that time seems likely to come when the types of tires in use become stabilized. It looked for a time as if the experience of 1926, 1927, and 1928, justified a belief that renewals per car had become stabilized, but it now appears that the balloon tire, the super-quality tire, and the demise of third and fourth-line tires have combined to give us lower renewal sales per car. If allowance is made for relatively higher tire consumption on trucks, busses, and taxis, the average private car owner does not have to buy very many renewals during the life of his car at present.

NOTE.—The graphs shown were plotted from the data given in the first table, but do not appear in the Special Circular No. 2865.—THE EDITOR.



Estimated Annual Tire Renewal Sales in Millions of Casings

Weftless Cord Fabric

THE following abstracts of United States patents relating to the manufacture of weftless cord fabric are continued from INDIA RUBBER WORLD, November 1, 1930.

54. Hopkinson and Cook, 1,512,095. Oct. 21, 1924. Rubberizing filamentary material consists in treating the filamentary elements with latex, paralleling the elements in proximity, and ironing the treated elements substantially dry to join them together in parallel relation with webs of rubber derived from the latex.

55. Hopkinson, 1,512,096. Oct. 21, 1924. A continuous method of manufacturing weftless fabric consists in arranging cords parallel in sheet formation, laterally and equally shifting the cords to vary their spacing, and calendering a film of rubber on the cords to hold them fixed in their changed relation, substantially equal distances between centers. (See group illustration.)

56. Respess, 1,515,792. Nov. 18, 1924. Unwoven fabric is made by coating threads or cords with a binding agent, conducting the threads or cords through movable guides in parallel lines to a gathering place, laying a binding sheet of fibers on a set of cords, conducting the coated threads or cords so that they run parallel to each other lengthwise of the sheet to be formed in a wavy or predetermined design, coating another set or sets of parallel threads or cords through a movable guide to a gathering place, depositing the second set of cords so that they run parallel to each other lengthwise of the sheet in a wavy or predetermined design to overlap the first set of cords, compressing the product, and drying it.

57. Weigel, 1,519,522. Dec. 16, 1924. Making a rubber and wire sheet with the wires uniformly spaced and embedded in the rubber and disposed on a bias to the edge thereof, is done by coating a flexible wire with soft unvulcanized rubber; winding the coated flexible wire upon a drum; disposing the successive convolutions thereof side by side thereon; then compacting and uniting the rubber of the adjacent convolutions; and during compacting, maintaining the wires spaced from each other and from the surface of the rubber; then cutting the rubber and wires transversely and at an angle to the longitudinal axis of the wires; and then removing the completed sheet from the drum.

58. Grabau, 1,520,342. Dec. 23, 1924. The method of making strands comprising threads arranged in superposed layers, consists in arranging the threads parallel and side by side in the form of a sheet, coating one surface of the sheet of threads with raw rubber, and grouping the threads into a layered flat bundle held together by the rubber.

59. Brennan 1,535,647. Apr. 28, 1925. Making a continuous band of cord stock for a pneumatic tire consists in covering a cylindrical mandrel with a layer of frictioning material, winding frictioned cords spirally about the mandrel to form a layer of cord, covering this layer with another layer of frictioning material, winding another layer of frictioned cords crosswise of the first layer, and cutting the layer into bands along a circumferential line.

60. Castricum 1,544,217. June 30, 1925. Uniting unconnected cords and rubber into sheet form comprises leading a sheet of rubber around one of the rolls and through the bight of the rolls of a calender, separately tensioning a plurality of cords, arranging them in parallel relation, heating and carrying the cords around the second roll through an arc of its surface sufficient to maintain them against displacement and through the bight of the rolls, and positively controlling the linear speed of the cords during the heating and coating operations so that their tension is maintained.

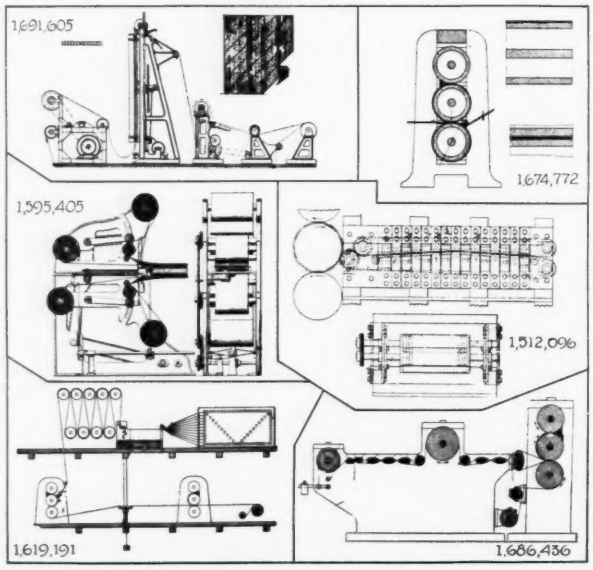
61. Baker, 1,546,772. July 21, 1925. Cord carcass material is made by enveloping a flat band with a plurality of cords, consolidating the cords into an adhering mass while on the band, and removing the consolidated material from the band by slitting it at the edges of the band to provide a plurality of flat carcass strips.

62. Respess, 1,557,329. Oct. 13, 1925. An unwoven tire fabric is made by interwinding a plurality of rubberized strands to form a compound helix, passing a sheet of rubber axially through the helix, bending each spire of the helix to cause its opposite portions to lie substantially parallel to the rubber sheet and upon opposite sides of the latter, bringing sheets of rubber into contact with the remote surface of such opposite portions of each spire of the helix, and pressing the several parts to form an integral structure.

63. Gessner, 1,573,390. Feb. 16, 1926. An apparatus for making weftless cord fabric comprises a warp beam constituting a supply for a plurality of cords, means for laying the cords in sheet form in parallel relationship, calender rolls for applying unvulcanized rubber thereto and non-rotatable bars, between the source of supply and the calender rolls, with which the cords are in frictional contact as they are pulled through the apparatus for holding all the cords under equal tension, all the cords being in the same plane.

64. Ingham, 1,595,404. Aug. 10, 1926. Cord fabric is produced by winding a single rubberized cord continuously around a stationary form, with successive convolutions of the cord in substantial contact throughout their length, causing the adjacent convolutions to adhere to constitute a fabric, feeding the accumulated cord along the form as successive turns are laid, and slitting the resulting tubular cord structure longitudinally.

65. Ingham, 1,595,405. Aug. 10, 1926. Cord fabric is formed by winding a single rubberized cord continuously around a fixed straight form and over a nonadhesive protecting sheet supported on the form, successive turns of the cord being laid close together and in substantial contact throughout their length and adhering to each other but not to the sheet; feeding the adhering convolutions and the sheet along the form as successive turns of the cord are laid; splitting the resulting tubular cord structure longitudinally to obtain a flat fabric; and winding up such fabric and the sheet together onto a reel. (See group illustration.)



66. Hennessy, 1,600,412. Sept. 21, 1926. A device for guiding cords comprises a grooved roller having a flat portion extending in a spiral from one end of the roll to the other.

67. Midgley, 1,605,453. Nov. 2, 1926. A method of facilitating the handling of a series of cords in the temporary stopping of the operation of producing weftless cords fabric upon a calender, comprises clamping the series of

cords, severing the cords between the clamping point and the finished sheet, securing the free cord ends thus formed, and unclamping the cords.

68. Jury, 1,608,102. Nov. 23, 1926. The method of manufacturing a rubberized fabric for incorporation in rubber articles consists in latex treating and drying parallel cord elements to form a weftless fabric, separating the fabric at intervals to form groups of bonded together cord elements in spaced relation to each other, and joining the spaced groups with rubber composition to form a sheet.

69. Macbeth and Dexter, 1,617,340. Feb. 15, 1927. An apparatus for applying a rubber coating to a cord fabric includes a standard calender roll arranged to have a film of rubber applied thereto, guides for positioning a multiplicity of alined cords in juxtaposition to the calender roll, spaced rollers over which the cords pass, a pivoted member for supporting the spaced rollers and means coacting with the member tending to press the spaced rollers towards the calender roll.

70. Castricum, 1,619,191. Mar. 1, 1927. A process of producing weftless cord fabric comprises arranging cords in spaced relation to form a sheet, applying a liquid to the cords, crowding the cords together laterally of the sheet and removing excess liquid, separating the cords and drying, and uniting the cords into web form. (See group illustration.)

71. Castricum, 1,624,532. Apr. 12, 1927. A cord guiding device adapted for use in the manufacture of weftless cord fabric comprises a multi-sided bar extending the full width of the cord web. The several sides of the bar have cord guiding grooves of differing spacing, and are separated by smooth surfaces of sufficient elevation to free the cords from adjacent guiding grooves.

72. Castricum, 1,624,533. Apr. 12, 1927. Apparatus for producing weftless cord fabric of the type wherein a sheet of unconnected cords is guided by a smooth surfaced roll against a sheet of rubber upon a calender roll, characterized by a guiding surface tangent to the smooth surfaced roll and furnishing the cords with guiding and spacing contact up to substantially the instant of their contact with the smooth surfaced roll.

73. Steere, 1,635,196. July 12, 1927. A method of obviating baggy cord fabric comprises assembling a cord fabric wherein the selvage cords are under substantially less tension than those in the body portion, which are under uniform tension.

74. Castricum and Taylor, 1,651,806. Dec. 6, 1927. Arrangement of calendering apparatus comprises two calenders, each having a plurality of rolls located in tandem, a pair of material supplies adapted for alternate use, and a pair of material guiding devices one being permanently associated with each of the supplies and positioned in cooperative relation to an intermediate roll of each calender on the side adjacent the other calender; whereby the material from the supply in use may pass between a pair of rolls of one calender, around one extreme roll of that calender, and between a pair of rolls of the other calender, and whereby material from either of the supplies may be coated on both sides by the two calenders.

75. Castricum 1,657,818. Jan. 31, 1928. A weftless cord fabric having a reserve of expansibility simulating that afforded by the crimp in woven cord fabric is produced by pressing a sheet of unconnected parallel cords against a sheet of rubber with a rapidly varying pressure whereby the cords assume a sinuous form.

76. Hopson, 1,657,829. Jan. 31, 1928. Making laminations of rubber and spaced parallel strain-resisting cords with rubber, consists in continuously calendering two sheets of warm rubber, continuously crimping the strain-resisting cords, continuously feeding the crimped cords between the rubber sheets immediately after the crimping operation, and pressing cords and rubber together.

77. Hopson, 1,657,830. Jan. 31, 1928. A laminated sheet of independent cords is bonded by rubber. Such cords have uniformly arranged crimps along their length arranged to increase their elasticity while bonded with the rubber.

78. Hopkinson, 1,660,924. Feb. 28, 1928. Sheet material is manufactured by webbing uncoated cords together in compactly contiguous parallel relation with bonding material applied to one face only of the sheets, the bonding material being excluded from the opposite face of the sheet by the compactness of the cords in the sheet; applying a backing to the webbed-together-cords; and uniting the backing to the bonding face of the webbed-together-cord.

79. Kmentt, 1,661,184. Mar. 6, 1928. This invention provides a machine for the continuous manufacture of warpless impregnated fabric stock by means of an endless mandrel adapted to travel in parts along a straight path, and means for properly compacting the impregnated fabric stock, for automatically cutting and winding it on suitable rolls.

80. Frank, 1,674,772. June 26, 1928. A calender for rubberizing a sheet of cords comprises a pair of rolls adapted to form a sheet of rubber upon one roll of the pair, a third calender roll positioned in calendering relation to the latter roll and provided with means for laterally supporting the cords as the cord sheet is subjected to pressure between the last named rolls, to rubberize the sheet of cords. (See group illustration.)

81. Manley, 1,677,359. July 17, 1928. Weftless fabric is prepared by passing a plurality of parallel strands free of filling over the breast beam of a loom, simultaneously passing a strip of cloth over the breast beam, and uniting the cloth and strands into a roll.

82. Clark, 1,686,436. Oct. 2, 1928. A guiding device for directing a series of unwoven cords into contact with a layer of unvulcanized rubber comprises a member provided with means located upon opposite sides thereof for engaging the cords and spacing them a uniform distance from each other in a direction transverse of their path of travel. (See group illustration.)

83. Hennessy, 1,691,605. Nov. 13, 1928. The method comprises forming successive cuts crosswise of the web and through the upper layer of rubber and the fabric without disrupting the underlying layer of rubber. The line of cuts is on the bias with respect to the length of the web. (See group illustration.)

84. Castricum, 1,714,848. May 28, 1929. A series of heated rollers are arranged in two widely separated sets over which the cords pass in zig-zag fashion, the last roller being located sufficiently close to the calender so that the cords are received by the latter in hot condition. The length of free cord path between the several heated rollers is sufficiently great so that the cords are equalized in tension at the same time that they are heated.

85. Wayne, 1,719,738. July 2, 1929. A cord fabric winding machine has a winding mandrel, a carriage operable to move back and forth longitudinally of the mandrel, means carried by the carriage for feeding a coated cord to the mandrel, and means on the carriage for delivering a moist spray to the cord and mandrel as the carriage advances.

86. Castricum, 1,723,501. Aug. 6, 1929. A cord guiding device comprises a rod screw threaded throughout its effective cord guiding length and fixed against rotation.

Mold Construction for Thin Rubber Articles

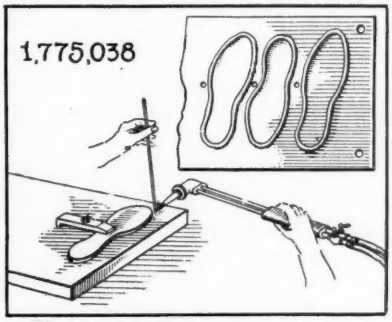
A novel method for constructing vulcanizing molds for thin rubber articles of irregular outlines, such as soles for shoes has been patented[1]. By this invention molds may be very expeditiously and economically manufactured.

Referring to the illustration, a steel base plate of the proper size is provided, to which a suitable form having the outline of a sole is temporarily clamped. This form or template is made of material such as copper having high heat conductivity and high fusing temperature.

While the template is clamped in position, a wall of iron is built up around it by autogenous welding of fused metal to the base plate. The fused iron accumulates as a wall around the matrix, thus forming a mold cavity.

The matrix is successively clamped in other positions upon the base plate, and the fusing process repeated to produce the desired number of mold cavities. When thus formed, the mold is finished by machinning off the top edges of the respective cavities.

[1] U. S. Patent No. 1,755,038, Apr. 15, 1930.



Building Up Sole Molds

EDITORIALS

New Year Is Promising

WITH the passing of 1930 the conviction grows apace that all its deficiencies will be well supplied by 1931. The cheerful belief that 1931 will be a much better business year than 1930 is expressed not by Pollyannas capable of seeing only the bright side, but by the most astute commercial analysts whose forecasts have proved not only sound but usually correct.

Most rubber and other manufacturers have learned much from the past year's adversity. By wisely curtailing production near to consumption, developing more efficiency in all departments, and making many long-deferred readjustments they have put themselves in a peculiarly good position to reap the benefits of the prosperity inevitable in the year just dawning.

One comforting feature is such an improved raw material status as to make most unlikely in 1931 any repetition of that bugbear of 1930, crude inventory losses. Dealers' stocks of tires, too, have seldom been as low, buyers' needs are so urgent that even a rumor of a price increase could stir up a lively demand, and not only is the statistical position of the replacement market very favorable, but a brisk inquiry for original equipment is imminent; and money is abundant at low rates.

With the outlook equally encouraging in countless other lines, the entire rubber trade should not fail to experience what this journal most earnestly wishes it—a prosperous new year.

The Season's Greetings

INDIA RUBBER WORLD *hopes that its family of readers and advertisers, who have appreciated its efforts in behalf of the great industry it represents, has had a really Merry Christmas. Earnestly, too, it wishes that they experience in the New Year greater material success and personal happiness.*

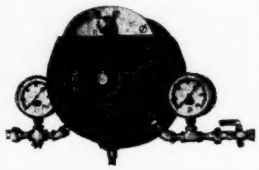
Why Prices Tend Downward

KEEN analysis is made of a problem which perplexes many economic students by Raymond Bill in "Declining Prices," *Sales Management,* November 29, 1930; and practical remedies are proposed for many commercial ills. In an exhaustive summary of price recession causes he lists: post war deflation, deemed a sound, inescapable development; overproduction, an evil which industry should ever strive to abolish; loss of markets, against which a foresighted, flexible policy should best insure; too much capital, often the penalty paid for executive pride and overweening ambition; liquidation, a fault of management which research engineering and intelligent selling should offset; expanding markets, a factor favoring increased employment and merchandising research; management efficiency, favorable if prices be lowered without lessening profits or wages; deflation of security values, usually a bearish speculative abuse.

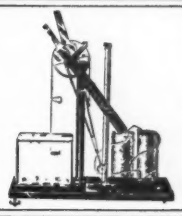
Then there is destructive competition, a grievous, inexcusable evil ruinous alike to labor and share-owners; manipulation and speculation, which may be diminished through education; pessimism, of evident futility when compared with the rewards of courage and optimism; loss leaders, inexcusable in sane competition; defective merchandise, rare with good engineering and management; declining material prices, under which buying is justifiable if above economic minimum; and elimination of relatively small business, a short-sighted policy for so-called big business, for efficiency, mechanization, and concentration can be pushed so far as to defeat even their ends and invoke dreaded government intervention.

Urging Courage in Selling

Some economists claim that the recent slow-up was caused more by underconsumption than by overproduction, that there can be no excess production until the millions who require more necessities and who want reasonable luxuries are satisfied, and that needs are greater than ever. They refuse to believe that this country needs fewer and stronger producers and distributers, since its greatness came through enterprise begotten of free competition. "Make more and not fewer goods, and push them," they advise. If industrial leaders would inject courage, enthusiasm, and aggressiveness into selling, it would not be long before they would find rational good times routing abnormal depression.



What the Rubber Chemists Are Doing



Early Stages of Oxidation in Rubber[1]

Quantitative Application of the Pyrrole Test

BETWEEN rubber and the simple products of its ultimate oxidation many stages intervene. For the practical rubber technologist chief interest in this oxidative process is centered in that portion which has occurred up to the time when the rubber has so changed that it has lost its value.

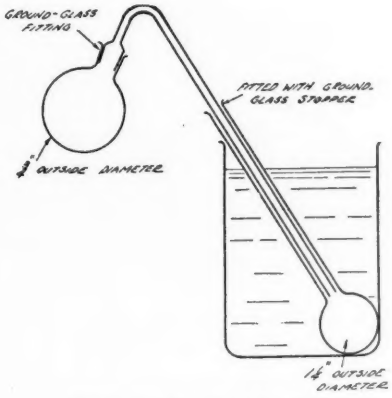
This paper describes a semi-quantitative application of the well-known pine splint-hydrochloric acid test for pyrrole derivatives which the authors have found useful in following the early stages of oxidation in rubber, particularly in vulcanized rubber. It consists essentially of digesting the aged rubber with fused ammonium acetate, distilling with steam, and treating an ether extract of the distillate with an alcoholic pine-wood extract to which has been added hydrogen chloride. A red color develops, compared with a set of permanent standards.

The accompanying illustration shows an apparatus developed for use in the test. With several of these in use simultaneously three or four analyses can be finished in from 20 to 30 minutes.

The rubber sample is cut into thin slices and accurately weighed. One gram is suitable for a stock only slightly aged, with smaller samples in proportion for those which are further advanced in oxidation. The sample is placed in the short-neck flask and from 2 to 3 gr. of crystalline ammonium acetate are added. After the delivery tube has been placed in position, the flask is gently heated with a small direct flame until the acetate is completely fused, using care to avoid charring the rubber. Gentle heating is continued for from 3 to 5 minutes in such a way that the level of condensing vapors on the sides of the flask rises barely to the ground-glass fitting.

After the flask has cooled, 8 to 10 cc. of water are added, and this is then distilled over into the long-stemmed flask as a receiver. Most of the ammonium acetate should remain in the distilling flask. The distillate in the receiver is diluted with water until it is about one-half way up the neck. It is convenient to make a mark on the neck of the flask indicating some definite volume. Two cc. of ether are added from a pipet. The flask is well shaken, and two layers are allowed to form.

[1] Presented before the Division of Rubber Chemistry at the 79th Meeting of the A. C. S., Atlanta, Ga., Apr. 7 to 11, 1930. Authors: J. W. Temple, S. M. Cadwell, and M. W. Meade, of the United States Rubber Co., Development Dept., Passaic, N. J.



Apparatus for Pyrrole Test

The shaking and the settling must be repeated several times in order to complete the extraction. One-half cubic centimeter each of alcoholic pine-wood extract, alcoholic hydrogen chloride, and the above ethereal layer are then mixed in the order named in a small test tube. After standing from 5 to 10 minutes the mixture is compared for color with the previously made standards. Values are calculated for 1 gr. of sample.

The pine-wood extract is made by extracting clean white-pine shavings in a Soxhlet apparatus for 16 hours. New shavings should be substituted about three times during the operation. The concentration of pine-wood extract seems to be unimportant provided an excess is present in the final determination. It has been found, however, that water in the alcohol tends to decrease the sensitivity of the test, and, although ordinary 95 per cent alcohol can be used successfully, better results are obtained if the alcohol is practically anhydrous and solutions are protected from moisture of the air.

The alcoholic hydrogen chloride is prepared by running dry hydrogen chloride into alcohol of the same composition as is used for the pine-wood extract, until it fumes strongly at the surface when exposed to the air. The two solutions must be kept separate until the test is made.

The accuracy of this method is not sufficiently great to demand the use of a colorimeter.

The ultimate scheme was the use of water-soluble dyes in dilute buffered solutions of pH 7.0, and glass-sealed in the small test tubes that were mentioned.

Basic fuchsin, modified by traces of malachite green and auramine, gave a close approximation of the color actually obtained with aged rubber. A solution of this was given an arbitrary value of 10, and it was diluted down through a graded series to a lowest member with a value of 0.1. The color of this last member was a very faint pink. Standards thus prepared, and sealed in glass, have not changed appreciably in the course of a year's standing. Cork or rubber-stoppered tubes are to be avoided since the substances in the stopper tend to react with the dye.

As a routine method for measuring deterioration, however, the pyrrole test can have only a limited application. The main use of the test has been in trying to follow the actual process of oxidation.

The pyrrole test indicates the beginning of the aging process at a much earlier stage than acetone extract data, and also that it is positive before there is any appreciable drop in tensile strength. The most interesting point, though, is that there seems to be a difference in character between aging in the oxygen bomb and in air at higher temperatures. In oxygen-bomb aging the pyrrole test continues to rise steadily throughout the course of aging.

In heat aging the pyrrole test is positive after the shortest period employed, but rises only very slowly as aging progresses and seems to tend to a maximum which is very little larger than the first value obtained. Roughly, the figures in oxygen aging are from ten to fifty times as great as the corresponding stages of deterioration due to heat aging.

Natural aging, as far as the pyrrole test is concerned, is intermediate between the two types of accelerated aging. There is no evident quantitative agreement between physical condition and pyrrole test. This emphasizes the important distinction that the test cannot be regarded as one for rubber oxidation products in general, but is for a specific product or class of products—and, it is believed, a class which occurs early in the oxidative process. There is consequently no reason to expect any exact correspondence between the pyrrole test and the physical properties of naturally aged rubber, since natural aging conditions can and do vary considerably, and some conditions may be expected to favor more than others the accumulation of a specific product.

Preparing Micro-Sections of Rubber[1]

Tracey F. Steele[2]

IN THIS laboratory it is frequently necessary to prepare micro-sections of a large variety of rubber compounds, cured and uncured, containing from 2 to 50 volumes of pigment. Smear mounts are quite satisfactory for the identification of pigments but not for dispersion investigations. There have been some indications that the pressure required to make the rubber thin enough to transmit light causes changes in the dispersion. Furthermore, rather high temperatures are required to cause the highly pigmented stocks to flow under the cover slip. Green's sulphur chloride method[3] of destroying the elasticity is unsatisfactory with uncured stocks, causes certain undesirable changes in the appearance of some stocks, and requires modifications in procedure with different types of compounds.

Freezing with liquid air has the inherent advantage that no permanent change is effected in the rubber and that all compounds, both raw and cured, can be treated essentially the same. Any of the usual mounting materials, however, such as paraffin wax, rosin combinations, etc., either crumble away, leaving little support for the rubber, or become so hard that the microtome knife is damaged.

The need for a mounting material which would overcome these difficulties brought wood into consideration. After experimenting with several kinds, basswood, a soft wood with a straight grain and a uniform fibrous structure, was selected. Only true basswood, especially *Tilia americana*, is suitable for this purpose. Wood from the tulip tree is sometimes incorrectly called basswood. Blocks 30 by 30 by 12 mm. (Figure 1) are cut and buffed flat and smooth on the surfaces to be in contact with the rubber. After a few coats of a thin rubber cement have been applied to these surfaces and allowed to dry, the specimen to be micro-sectioned, which should be about 8 by 2 by 0.5 mm., is placed between two of the blocks with its length at right angles to the grain of the wood, so that the sections will be cut parallel to the long fibers of the wood (Figure 1). The mount is then placed in a vise under pressure for several hours.

When the mount is removed from the vise, it is carefully buffed on a grinding wheel, leaving a projection of wood holding the rubber (Figure 2). The block is then placed in the microtome clamp and liquid air applied with a ¾-inch paint brush. Liquid air is applied freely at first to prevent further contraction after cutting has been started. The mount has to be moved up 15 or 20 microns after the initial contraction due to the freezing, and liquid air should be applied frequently to prevent subsequent expansion. The microtome should be either hand-operated or of rapid short stroke. With such an instrument several micro-sections may be cut after each application of liquid air.

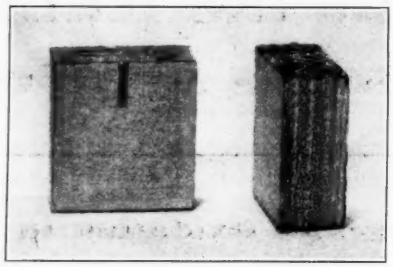


Fig. 1. Samples Clamped between Basswood Blocks

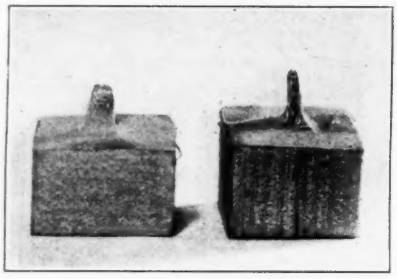


Fig. 2. Blocks Ground Away Ready for Sectioning Samples

If permanent slide mounts are desired, it has been found best to use a dry knife and to select the best specimens under binoculars after they have been collected on a slide with a teaser. If the mount is not to be permanent, a few drops of glycerol on the knife collect the sections as they are cut. The glycerol carrying the sections is transferred from the knife to a slide with a glass rod and the cover slip applied.

For permanent mounting Aroclor 1257 is very satisfactory. Its refractive index is about that of glass and its melting point is lower than most of the mounting media otherwise suitable for rubber. While the slide is warm, a gentle pressure on the cover slip usually causes the wood fibers to move away from the rubber which they have supported, giving an unobstructed view of the micro-section.

Owing to the tackiness of uncured stocks they are more difficult to micro-section, and great care must be exercised in handling them to secure satisfactory slide mounts. Excessively milled uncured compounds are too soft to be micro-sectioned. With this one exception the method as outlined has been found entirely satisfactory for micro-sectioning all types of rubber compounds, regardless of the amount of pigment or the state of cure.

IT IS ESTIMATED A CUTTER WILL BE disabled for 35 days as a result of his falling from a counter and striking his back. This employe was making up an odd ticket, and in order to reach work he stood on an open drawer, then on counter, and in stepping back lost his balance and fell. *National Safety News.*

[1] *Ind. Eng. Chem.*, Analytical Ed., Oct. 15, 1930, pp. 421-22.

[2] The New Jersey Zinc Co., Palmerton, Pa.

[3] Green, *Ind. Eng. Chem.*, 13, 1130 (1921).

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Rubber Division A. C. S.

New York Group

THE meeting of the New York Rubber Group, Rubber Division, A. C. S., was held as scheduled in the Roof Garden of the Park Central Hotel, New York, N. Y., December 10. About 225 chemists and others interested in the rubber industry were present. An excellent turkey dinner was served, and lively music was rendered by a dance orchestra. At each plate the diners found a collection of souvenir articles contributed by rubber goods manufacturers and dealers in compounding materials. Preceding the scientific program, W. H. Whitcomb was unanimously elected chairman of the group for 1931, with power to appoint a secretary-treasurer to serve concurrently with him. Mr. Whitcomb was formerly professor of chemistry at Miami University, Oxford, O., and subsequently Director of Laboratory Control, Footwear Division, U. S. Rubber Co. He is now identified with the Henry L. Scott Co., Providence, R. I.

Prof. Donald Laird, of Colgate University, discussed informally the importance of reodorizing rubber goods, emphasizing the sales influence exerted by the psychological effect of beauty. This charm of beauty appeals through the eye by color and form, through the ear by pleasant sounds, and through the nose by agreeable odor. The importance of reodorizing rubber goods, particularly those for personal use, has been revealed by a survey indicating that the usual odor of rubber goods, present even in minor degree, serves as a sales resistance that should be overcome.

The speaker said that unpleasant rubber odors result from breaking up of certain sulphur bearing accelerators in vulcanization, from products formed by surface oxidation of the rubber, and from the use of certain reclaimed rubbers. Chemically reodorants of rubber should not be subject to oxidation, nor influence the colors used in the goods. They must also serve as softeners. Psychologically it may be satisfactory to destroy an obnoxious odor, but it is better to substitute for it some mild and appropriate good odor that will remove sales resistance and suggest quality as well.

A talk on the manufacture of carbon black illustrated in detail by excellent moving pictures was given by Donald F. Cranor, service control department, Binney & Smith Co.

The movie, in six reels, was extremely interesting and instructive, picturing in complete detail all the steps in the production of Micronex by the channel system, from locating the gas well to shipment of the refined and tested product.

Reel 1 began with an animated diagram illustrating a gas area in geological cross-section. Following came field work pictures of surveying a gas area, staking the well location, and the derrick operations of rotary drilling in Louisiana. A well of 53,000,000 cubic feet daily capacity was pictured coming in at 1,050 pounds' well pressure. The ignition of the gas by the heat of friction is safeguarded by filling the well with water, which cools the heating effect of friction on the casing as the well blows in. Some of the wells are a mile in depth.

Reel 2 was similar to Reel 1 and depicted cable drilling in Texas.

Reel 3 showed the operations of clearing a gas pipeline right of way, trenching, uniting pipe sections and laying them across a bayou by cable haulage by a motor truck on the opposite side of the water. Measuring and testing the gas as well as complete plant lay-out for separating gas from gasoline, were pictured.

Reel 4 was devoted to a typical carbon black plant, showing the arrangement of hothouses and other plant buildings and interior details.

Reel 5 gave details of the gas burning, including burner and channel arrangement and operation of flames, channels, and scrapers in action.

Reel 6 exhibited views of refining, bolting and blending, packing, compressing, warehousing, and shipping of the black.

Every step in the production of carbon black from gas to the finished product is characterized by scientific control.

Following the scientific program the assembly was entertained with a guessing contest to determine the number of molded rubber stoppers contained in a glass vessel in view of the assemblage, and with a balloon blowing contest. Prizes were awarded to the winners in each event. Walter Grote assisted by Fred Batchellor performed clever sleight-of-hand tricks. Lively interest was stimulated in the distribution by lot of numerous articles contributed for the purpose by many rubber manufacturers and other sources. The gathering adjourned at a late hour after a vote of appreciation to the retiring chairman, W. L. Sturtevant, and to the retiring secretary K. J. Soule.

Chicago Group

THE Chicago Group, Rubber Division, A. C. S., held its second meeting of the current season Friday evening, December 5, in the dining room of the Auditorium Hotel, Chicago, Ill. At this meeting the group adopted a constitution, and is probably the first to place its organization in permanent form. Following the short business meeting, two papers were presented of great interest to rubber technologists.

A paper on "Manufacture of Sponge Rubber" was presented by H. G. Bimmerman, of the E. I. du Pont de Nemours & Co. Chemical Laboratory, Wilmington, Del. This paper covered the manufacture of sponge rubber historically and discussed present-day factory production. Mention was made of some of the interesting patents, and a brief summary given of air and open steam-cured sponges, with detailed information on press cures. Rubbers, pigments, accelerators, antioxidants, blowing agents, and colors were discussed at some length. Rigid factory control is necessary to manufacture sponge products of uniform attractive appearance and of high quality. Major production difficulties were mentioned, and remedial methods suggested. A few of the popular uses of sponge rubber were mentioned, giving an idea of the general application of this product.

F. L. Dawes of the engineering staff of the Adamson Machine Co., Akron, O., described the construction of the tubing machine and the advantages in its use. The members showed great interest in this paper, and the speaker was called upon to answer many questions regarding tubing methods. The experiment was made at this meeting of recording for future reference the discussions on the papers.

The Chicago Group expects to hold its next meeting in February, and the Program Committee promises some very interesting papers.

President of A. C. S.

Professor Moses Gomberg, of the University of Michigan, becomes president of the American Chemical Society on January 1, 1931, for the term of one year. He succeeds Dean William McPherson, of Ohio State University, and in turn will be succeeded in 1932 by Dr. L. V. Redman, vice president and director of research of the Bakelite Corp., Bloomfield, N. J. By a recent change in the A. C. S. constitution the society now elects each year a president and a president-elect who serve in successive years.

Symposium on Abrasion Testing

Preliminary plans have been completed for holding a symposium on the abrasion testing of rubber products to take place at the Annual Meeting of the American Society for Testing Materials in Chicago, Ill., June 22 to 26, 1931. The papers will include theoretical and practical considerations and will involve not only abrasion tests but also cutting and tearing tests. The initial date for the receipt of titles of papers has been extended to the middle of February, and every one who has a paper or suggestions regarding the symposium is requested to communicate with Arthur W. Carpenter, Secretary of D-11 on Rubber Products of the A. S. T. M., The B. F. Goodrich Co., Akron, O., or with Harlan A. Depew, Chairman of Subcommittee XIV on Abrasion Tests, The New Jersey Zinc Co., Palmerton, Pa.

Aroclors Chlorinated Diphenyl

Diphenyl products, chlorinated in various degrees and bearing the trade name "Aroclors," are among the new ingredients being tried out in rubber compounding and for other purposes. Those with the higher chlorine content are said to be particularly soluble in the usual organic solvents and readily miscible when hot in rubber, sulphur, asphalt, paraffin, and natural waxes. Viscosity ranges from that of water to a solid resinous stage. Tests are being made with a light yellow waxy type, said to be tacky and non-drying, in the manufacture of adhesive tape, rubber cement, and a substitute for chicle chewing gum.

Technical Communications

Combination Accelerator

DI-ESTEREX-N is a new accelerator of the ester and guanidine type. It possesses the desirable general characteristics of the ester class of material, functions at low or high temperatures, produces snappy cures of high tensile and great wear resistance. The material is a pale yellow powder with a specific gravity about 1.24. It disperses easily and quickly in crude or reclaimed rubber and is free from blooming both in uncured and cured stocks.

This accelerator is not recommended for white or delicately colored goods. While it can certainly be termed an excellent general purpose accelerator, it seems of special merit in certain places. For example, in gaiters or rubber surfaced footwear Di-Esterex-N is very desirable because of its ability to give relatively short air pressure cures at 250-260° F., cures that afford a very dry, hard, firm surface of bright attractive appearance and desirable feel.

The type or state of cure given by this accelerator in tire treads and mechanicals offers unusual resistance to flexing at elevated temperatures and high abrasion resistance in loaded stocks. Finally in molded inner tubes Di-Esterex-N gives high tensile and good cures at both 40 and 60 pounds of steam. From 1.125 to 1.315 of Di-Esterex-N is recommended with 2.25 per cent of sulphur on 100 of rubber, depending on whether the cure is to be 60, 50, or 40 pounds. Data from Naugatuck Chemical Co., 1790 Broadway, New York, N. Y.

Rubber Reodorants

THE first of a new line of materials for reodorizing or imparting a pleasing odor to rubber goods is known as "Rodo." The spelling of this name is the reverse of the word odor and its plural form is given as "Rodos." These materials are composed of a variety of essential oils blended to impart a good smell. If a single substance were used its odor would in time become tiresome or even offensive. In selecting aromatic materials for a pleasing blended odor it is necessary that they be free of objectionable features. Thus Rodos do not affect rate of vulcanization or affect aging unfavorably. Neither do they cause discoloration when used in colored goods.

The amount of reodorant required depends on the ingredients in the rubber mixing, its cure and the final odor desired. Based on the total weight of the batch 4 ounces per 100 pounds is sufficient. If the stock is very heavily loaded with pigments and fillers slightly more should be used.

Thus the strength of the odor may be regulated according to the color and size of the article. For the lighter colors a mild odor should be used and for the darker colors a heavier and intense odor. Data from R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y.

Blooming in Unvulcanized Rubber

THE surface bloom or crystallization of sulphur which often appears on uncured rubber is a serious cause of factory trouble and disappointment. At ordinary temperatures about 1 per cent of sulphur will dissolve in rubber and consequently mixings containing less sulphur than this should normally show no bloom. Such a percentage of sulphur is the exception rather than the rule, and often special precautions are necessary to prevent blooming. Four main items cause surface crystallization of sulphur:

(1) Rapid cooling or chilling of the surface.

(2) Too high a temperature during mixing, causing the sulphur to dissolve completely and leaving no nuclei around which internal crystallization can start.

(3) Contact, while warm, with sulphur dust, thus providing a starting point for surface crystallization. This cause is very prevalent since minutest particles are sufficient for the purpose.

(4) Sulphur of unsuitable type. The sulphur used should be sufficiently crystalline and contain a proportion of insoluble sulphur to provide for internal crystallization. Furthermore, the sulphur content of the batch should be sufficiently high to insure undissolved sulphur remaining after mixing. Internal crystallization can be further helped by the introduction in the mix of other isomorphous crystalline particles.

Care in processing and stocking mixings will materially help to overcome trouble. For example blooming is favored if the stock is subjected to wide variations in temperature during storage. Also reclaimed rubber reduces blooming tendency quite materially. Data from an English Chemist.

Machining Hard Rubber

THE special alloys, Stellite, Circle C, and Carboloy, are recommended for machining hard rubber in preference to ordinary tool steels. Diamond tools also give good results, and grinding wheels operate to good advantage where they can be used.

High speed twist drills give good service and longer life than ordinary carbon drills. Some manufacturers make special drills for operation with hard rubber. A spindle speed of 2,800 r.p.m. is satisfactory for drills up to 3/8-inch. Above this size reduce the speed to from 1,000 to 2,000 r.p.m., depending on the size of the drill and depth of hole. The lips of the drill should be ground to an angle of 45 degrees, and the sharp edge of the lip should be ground off.

No lubricant is necessary for drilling small holes, but various cutting lubricants on the market are advantageous when drilling large holes. This also applies to threading pipe. Pipe threading can be done with chasers, split adjustable dies, or self-opening die heads. All chasers and tools should be snubbed about 15 degrees, same as in handling brass. Data from American Hard Rubber Co., New York, N. Y.

Tire Reclaim—620

A NEW type of whole tire reclaim designated as 620 has recently been developed. It is well suited to carcass stocks. Some new principles employed in its composition and manufacture confer upon this reclaim some unusual characteristics. Stocks containing 620 give very good flexing, tensile, and stretch; age well; cure firmly; and are very homogeneous because of the fact that the reclaim is practically free from lumpy particles. It is important to the consumer that 620 mills and calenders smoothly and is neither too dry nor too sticky in a carcass stock in whatever amounts it is used.

The tentative specifications of reclaim 620 are as follows:

Specific gravity (corrected)	1.21
Ash	21.50
Acetone extract	9.00

PHYSICAL PROPERTIES

Cured with 5 per cent Sulphur at 286° F.

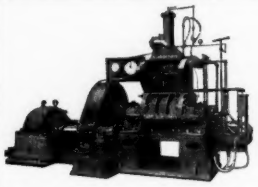
Minutes' cure	15	25	35
Tensile (pounds)	650	950	1,000
Elongation (per cent)	390	460	440

Tensiles at optimum cure are in most cases above 1,000 pounds. Data from Rubber Regenerating Co., 1790 Broadway, New York, N. Y.

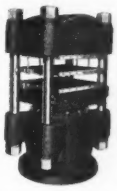
"Cair-Free" Tire Cores

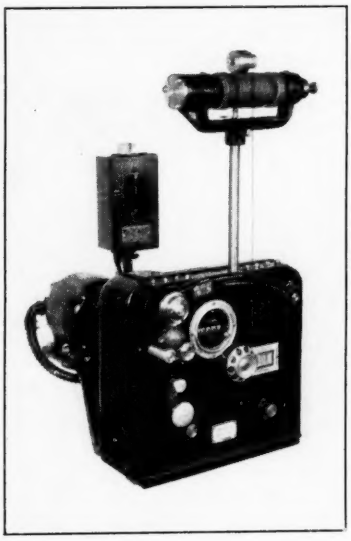
A NEW tire valve core has been produced in response to demands for a core capable of withstanding the conditions of tire heat in the present-day hurricane speed of automobiles over improved highways, and to overcome the extraordinary difficulties of bus tire operation. The new cores are called "Cair-Free" because they have been proved to meet every test. They are made to withstand the severest temperature conditions by the introduction of a special rubber composition and special springs. The new core, furthermore, permits more rapid inflation and deflation of inner tubes and thereby effects considerable saving of time by the motorist and in the shop.

Manufacture of this special valve core was begun for valves in heavy bus service. However, the quick recognition accorded the new core on the part of tire manufacturers speedily caused extension of its production to supply the demand for regular tubes. In addition production has now been accelerated to meet the needs of the replacement trade. Data from A. Schrader's Son, Inc., Brooklyn, N. Y.



New Machines and Appliances





Sibley-Pym Great Circle Winder

Golf Ball Winder

AN IMPROVED automatic golf ball winder, here pictured, embodies simplicity of construction and operation and dependability as a machine to produce quality in the ball at reduced winding cost.

The general design is pleasing and the materials and workmanship are of superlative quality. All rolling parts are mounted on the highest grade ball bearings, and lubrication is well provided for. Each machine is equipped with a ¼-h.p. motor. While this is larger than required, it gives greater motor dependability and at the same time meets the various electrical requirements and will pass the electrical regulations of all state and local inspectors.

One of the distinctive features of this winder is its system of winding, which is as follows: A detector wheel engages the revolving ball on top and selects the low spots on the ball, presenting them in the path of the oncoming thread. Generally speaking, this winding follows the great circles fairly close and may be described as great circle winding.

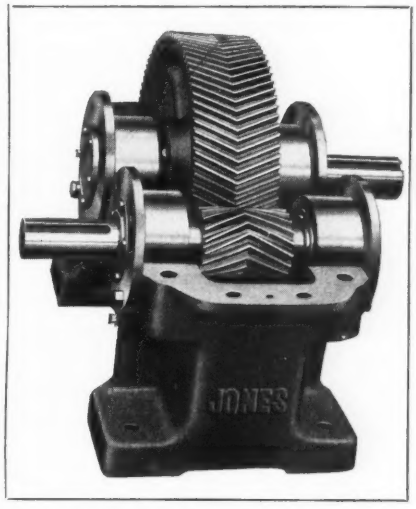
The detector method of winding insures application of the thread just where it is most needed at every particular instant, thus producing balls of a high degree of roundness. It also causes the rubber to be efficient in action. The efficiency of great circle winding tends to give greater distance in the ball when driven by the golfer. Tension of the thread in a golf ball is the vital element of the ball. In this winder the tension is automatically obtained to any gradation desired by magnetic resistance. It is independent of friction or springs and not subject to any wear.

The winding of the core, after it is inserted in the machine, is entirely automatic and requires no skill on the part of the operator, who can successfully attend several machines. The number is dependent on the size of core and thread used. From 40 to 60 balls per hour can be wound on cores ranging from ¾- to 1 3/16-inch. Production is approximately 150 balls per hour per operator, varying with the size of core and thread employed. Sibley-Pym Corp., Lynn, Mass.

Short Center Drive

IN ANY belt drive the power transmitted is directly dependent on the grip between the belt and the pulleys multiplied by the belt tension. For a given combination of belt and pulleys the grip is constant, and by mounting the motor on a properly located free-swinging pivot, such as the device here shown, its own weight automatically maintains correct and uniform belt tension. Thus is insured at all times uniformity in starting, speed, and transmission up to full capacity of the motor.

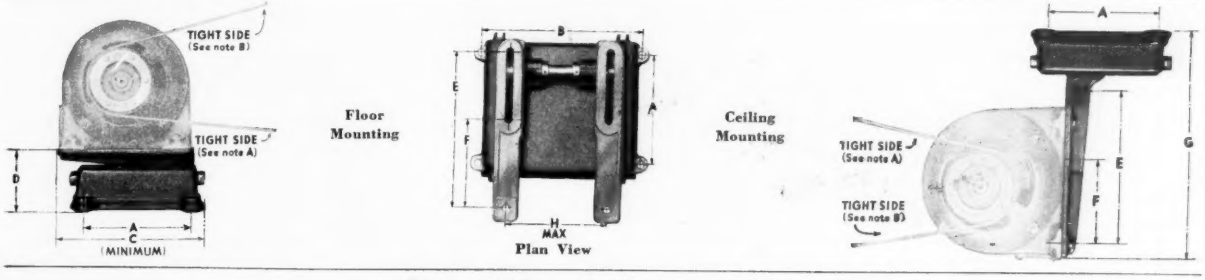
Drives may be operated with the Rockwood base in any position so long as the driven shaft is not lower than the motor shaft. The bases for short center drives can be mounted on floor or ceiling as indicated in the illustration, which also represents the base in plan view. The Rockwood Mfg. Co., 1801-2001 English Ave., Indianapolis, Ind.



Single Type Herringbone Gear Reducer with Hood Removed

Gear Speed Reducer

THE illustration represents a totally enclosed, single-reduction, continuous tooth, herringbone gear speed reducer. It is designed and manufactured in accordance with the latest engineering practice. There are many opportunities to use such drives to advantage in the rubber manufacturing industry because of the following features: Due to the design and inherent strength of this form of gearing the gears occupy a comparatively small space, considering the horsepower transmitted; they are relatively simple in design; and are readily accessible for inspection. Not only are the gears capable of carrying very great loads, but the casing in which they are mounted is heavily designed to take care of peak or shock loads under the most severe operating conditions. Power is transmitted uniformly from the motor to the driven machine without slip, and the gears may be operated in either clockwise or counterclockwise rotation.



Rockwood Bases for Short Center Drives

The drives are quiet in operation owing to overlapping action of the herringbone gears, combined with a limit system of interchangeable manufacture throughout.

Operating efficiencies of 97 to 99 per cent in properly lubricated drives are due to the excellent rolling action of the gears and the use of roller bearings for all shafts.

Other notable advantages of this reducer are: long life as a natural result due to high carbon and alloy steel heat-treated gears; permanent alinement of gear centers; accurately generated gears; few parts; conservative ratings, and splash lubrication.

It complies with present-day safety requirements, as all moving parts are totally enclosed. W. A. Jones Foundry & Machine Co., 4401 W. Roosevelt Rd., Chicago, Ill.

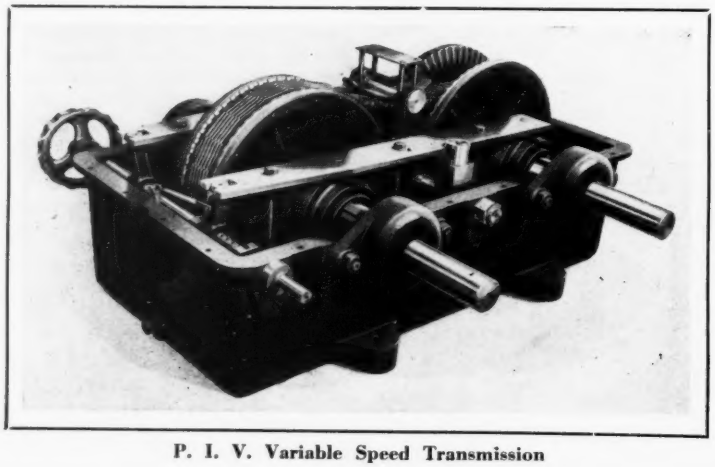
Variable Speed Transmission

WHAT is claimed to be the first all-metal variable speed transmission is here pictured. It is called the P.I.V. gear, indicating its characteristics: namely, positive, infinitely variable.

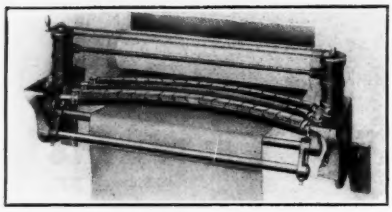
This new speed change unit consists of two pairs of wheels of the opposed conical disk type, between which a unique chain transmits power. The effective diameters of each pair of wheels can be altered under load to change the speed ratio, without steps and without dependence upon friction. On changing speed, the self-pitching chain rises in one set of wheels and descends in the other; so that while the input shaft connected to a motor or other source of power turns at constant speed, the output shaft is brought to the desired r.p.m. The wholly original feature of the P.I.V. gear is its use of a positive chain drive to transmit the power. Radial teeth are cut in the conical faces of the driving disks, and the self-adjustable teeth projecting beyond the sides of the chain are arranged positively to engage the radial teeth of the disks.

The chain used in the P.I.V. gear is made up of a series of steel leaves or links with joints consisting of hardened steel pins turning in segmental bushings. There are no teeth on the inner surface of this chain. Instead, what may be called teeth are made up of packs of hardened steel laminations or slats which extend through slots in the links at right angles to them, and project about ⅛-inch at each side of the chain. The individual containers which hold the packs of slats are secured in the openings of the links, but within each container the slats are free to slide from side to side individually with relation to each other and adjust themselves to engagement with the radial teeth of the disks, over substantially the full range of diameters. The angle of the slat ends is 30 degrees, the same as that of the conical faces of the wheels.

The teeth of the disks widen from the center outward toward the circumference, but are of uniform depth. They are so staggered relatively on each pair of wheels that the slats move back and forth into the teeth to mesh correctly as the chain comes into contact with the wheels. Self-pitching of the chain to any tooth width or wheel diameter is thus assured. At each engagement of chain and wheels, the slats are regrouped within their separate containers, but do not slide nor move under working pull. Their movement in engaging with the wheels is complete before the load is applied. Link Belt Co., 910 S. Michigan Ave., Chicago, Ill.



P. I. V. Variable Speed Transmission



Leyland Cloth Expander

Three-Bar Expander

IN ALL rubber calendering operations a cloth spreader is a desirable attachment for spreading to full width and guiding the fabric into the calender without wrinkles. A spreader is particularly indispensable when the material being calendered is of light weight or construction.

The triple bar regulating cloth expander shown in the illustration is particularly suited for fine work. It is built either as indicated with the bobbins or clutches uncovered; or if the expander is to be used for silk, rayons, and very fine cotton piece goods, these parts may be covered with rubber sleeves sealed at both ends. Thomas Leyland Machinery Co., Readville Station, Boston 37, Mass.

Fabric Hose Washer of Foreign Design

COTTON or other fabric, rubber lined fire and mill hose should, for its preservation, be washed free of mud before being put away for subsequent use. A hand operated machine of German design and manufacture built for this work is here illustrated. A motor driven type is also available.

The machine rests on an iron frame supported by four legs and can be made movable by fitting wheels to it. Its size is about 59 inches long by 27½ inches wide. In detail the machine comprises a pair of hand or power operated cylindrical brushes which revolve opposite each other and are spaced automatically to compensate for wear and the variable thickness of hose.

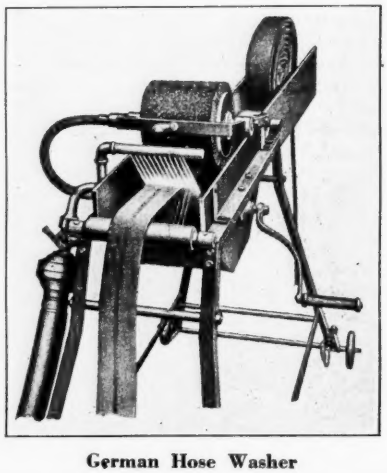
In front of each brush a perforated copper pipe is located through which the wash water streams with great force against the hose to be cleaned. The pipes can be turned so that the angle at which the water strikes the hose may be adjusted according to desire. Both pipes branch from a supply fitting with stopcock and hose connection. Below the pipes and brushes is a container with discharge pipe and hose connection for carrying away the water.

In operation the hose to be cleaned is passed between the revolving brushes flooded by the water jets above and below.

If the hose is so dirty that rinsing alone does not suffice, the brushing is prolonged, holding back on the hose.

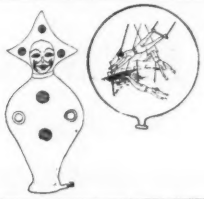
As the waste water can be carried off readily, the device can be set up anywhere, either indoor or outdoor.

The efficiency of the machine permits large quantities of hose perfectly and easily to be cleaned in an extremely short time. Albert Ziegler, Giengen and Brenz, Germany.



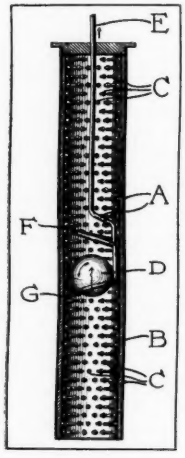
German Hose Washer

New Goods and Specialties



Device for Washing Golf Balls

GOLFERS will be interested in the convenient washing device here pictured, the function of which is easily and thoroughly to clean soiled golf balls. Referring to the illustration, the construction of this device comprises a deep non-rustable metal can *A* open at the top. Within the can fits a cylindrical brush in the form of a rubber tube or sleeve *B*, having molded on its inner surface flexible rubber projections *C* that serve to clean the surface of a golf ball *D*. This tube readily may be slipped into the container in which it is held by frictional contact with the container wall.



Golf Ball Washer

For inserting the ball *D* into the container and reciprocating it in contact with the rubber bristles, an operating rod *E* is provided having a suitable handle at its upper end and a pair of spaced rings, *F* and *G*, at its lower end with which to manipulate the ball.

The device is operated by seating the ball on the lower ring *G*. As the rings are forced downward into the tube, the upper ring *F* carries the ball downward and subjects it to the scrubbing action of the rubber bristles, which, owing to the water within the tube, effectually cleans the surface of the ball.

Rotation of the ball as it is moved up and down within the tube in order to scrub all parts of its surface is accomplished by locating the rings *F* and *G* in oppositely inclined planes.

Semi-Liquid Center in Golf Ball Prolongs Its Life

A MAJOR problem in golf-ball making is to add life to the ball, life in its responsiveness to the blow of the club as well as life in terms of long and dependable wear. After much experimenting, especially since the advent of the liquid center, The Worthington Ball Co., Elyria, O., has announced a semi-liquid center that increases in life as the ball is used. It is claimed that this new center cannot go dead or flat. Expansion is created by agitation, caused by the blow of the club, thus retaining a liveliness throughout the life of the ball. This new life is said to insure maximum resilience, quicker get-away, greater speed, and utmost distance.

Made with Semi-Liquid Center

Sponge Rubber Accessories Add to Shoe Comfort

NO MATTER how good-looking or expensive a shoe is, if it does not feel comfortable, it should not be worn. Often, however, a slight adjustment will remedy this. Such accessories, designed to correct minor defects of the average foot, are made by the Lyons Hose Protector Co., Omaha, Neb. Included among its sponge rubber products are metatarsal pads, arch supports, heel supports, Heel Strait pads, and Dubl-Grip scientific hose savers. These items are manufactured in an assortment of sizes and shapes, for men as well as women, for every requirement. They usually are packed a pair to a glassine bag. Some of them, such as the metatarsal pads and the arch supports, are placed in the shoe by special cement, supplied in tubes.

G. E. Handy Shop Light

Rubber Moistener and Sealer

THE newest novelty in sealers, and one based on hygienic principles, is made entirely of rubber, hard, molded, and sponge, combined. Fashioned like a fountain pen, the container for the water is a hard rubber barrel. Into this fits a perforated piece of molded gray rubber provided with a flange, which forms the cork. To the latter is clamped by a small wire stitch a piece of red sponge rubber, which serves as the moistener when the water in the barrel finds its way out.

Hydrawlik Fountain Moistener

The Hydrawlik Fountain Moistener, in black or colors to match finishings on the desk, stands upright on its handle. It is automatic in action and supplies the required moisture from the reservoir, drawing back any superfluous water. Among its claimed advantages are: it does not break or rust; it stays clean and neat; it safeguards health by acting as a positive remedy for the risky and unsanitary practice for moistening stamps, labels, etc., with the tongue.

Directions for its use follow: Remove the vacuum suction unit and fill the reservoir nearly full with water. Hold the spongy mouth vertically close to the surface, pressing down slowly and lifting up slightly until sufficient water appears to moisten the gummed surface. Or you may conveniently moisten the places for stamps or labels and then stick them on. Hydrawlik Corp., Roselle, N. J.

Indestructible Hand-Lamp for Factory Use

IN RUBBER factories hand electric lamps are indispensable. They are particularly liable to breakage by rough handling and accidents of all sorts. Therefore, the sturdiest lamp on the market well merits the attention of shop men. As here pictured, it comprises a steel guard with swivel hook. Its aluminum socket is weatherproof, and its reflector shades the eyes from direct rays. The socket is connected by the highest quality all-rubber cord to a molded soft rubber plug which is unbreakable. It is a part of the cord and remains so after years of service. General Electric Co., Bridgeport, Conn.

Editor's Book Table

New Publications

"A New Type of Whole Tire Reclaim —620." The Rubber Regenerating Co., Naugatuck, Conn. This bulletin presents the characteristics and tests of a new reclaim, with recommendations for its use in tires, belting, hose, or other goods in which plied fabric must give long-flexing life.

"Bristol's Automatic Controller Valves, Motor Operated." The Bristol Co., Waterbury, Conn. In this catalog, No. 2,002, the latest developments in Type *BK* for steam, water, air, and gas are described and illustrated. Of special interest is the *BK* valve for floating control.

"Di-Esterex-N Rubber Accelerator." The Naugatuck Chemical Co., Naugatuck, Conn. The semi-ultra accelerator Di-Esterex-N is described as to its nature and adaptability in footwear, tires, inner tubes, and mechanical goods in which good flexing and high abrasion resistance are essential factors.

"Retardex." The C. P. Hall Co., Akron, O. This bulletin contains data and examples showing briefly the effect of Retardex on different accelerators in preventing scorching, improving the tensile properties of the cured products, and simplifying the handling of low temperatures.

"Airubber Equipment." New York Rubber Corp., Beacon, N. Y. This illustrated catalog describes the full "Airubber" line of seat cushions, life preservers, swimming floats, mattresses, and inflatable boats for personal use. These inflatable articles are of unique design and patented construction, rendering them dependable for exacting service in the home and the office as well as for camping, hunting, and aviation.

"Industrial Truck Tires." Simplified Practice Recommendation R103-29, United States Department of Commerce, Bureau of Standards, Washington, D. C. This pamphlet outlines the history of the project of elimination of waste through simplified commercial practice as applied to all types of industrial trucks, trailers, and tractors. The cooperation of producers, distributers, and consumers by adherence to the plan is solicited. Blanks are included for those desiring data on simplified practice.

"Corona Prevention and Ozone Elimination with Rubber Insulated Wires and Cables." By E. W. Davis and G. J. Crowdes, Simplex Wire & Cable Co., 201 Devonshire St., Boston, Mass. This pamphlet is a reprint of a paper presented by the authors before the Underground Systems Committee of National Electric Light Association, Montreal, Canada, October, 1930. The paper describes a new solution of the ozone problems, which has been made the subject of patent application. Two appendices discuss mathematically the empirical formula for visual corona for plain wire and the formula for critical specific inductive capacity of an insulated cable.

Book Reviews

"A. S. T. M. Standards (Issued Triennially) 1930. Part II, Non-Metallic Materials." American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Cloth, 1214 pages, 6 by 9 inches. Indexed. Illustrated.

The 1930 Book of Standards is published in two parts: Part I covering Metals, and Part II covering Non-Metallic Materials. The latter part contains 251 standards, of which 248 relate specifically to non-metallic materials. Of these, 14 relate to rubber products, and 23 to textile materials. Both groups have special interest for rubber technologists.

"Domestic Renewal Sales of Automobile Casings." Special Circular No. 2865. By E. G. Holt, Chief, Rubber Division, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 22 pages, 8 by 10½ inches, mimeographed.

This circular, dated December 10, 1930, is a comprehensive statistical study of much interest and value to manufacturers and dealers in pneumatic tires. Results and conclusions, based on an analysis of 20 years' history of tire renewal sales, are offered to aid the rubber industry in forecasting domestic renewal sales of tires in the future.

A succession of statistical tabulations worked out in accordance with the plan of analysis precede the final results compiled as "Estimated Renewal Sales Per Car" and "Production of Automobile Casings by Types." From this study the author draws sundry pertinent and valuable conclusions bearing on the decline of tire renewal sales.

"Rubber Producing Companies—1930." Official Guide for Investors in Rubber Shares. Compiled by Mincing Lane Tea & Rubber Share Brokers' Assn., Ltd., and "The Financial Times," Ltd., both of London, England. Boards, 685 pages, 5¼ by 8 inches. Price 7s. 6d.

This annual volume is arranged on its customary plan, giving full particulars of 600 rubber companies including those with tea and coffee interests. The preface of the work reviews the 1930 situation regarding crude rubber production, consumption, and stocks. In it the opinion is advanced that if the price of rubber remains under 6 to 7d. per pound for a reasonable extended period, the greater will be the chance of consumption advancing to the level of production, with a consequent longer period of prosperity for the plantation industry.

Industry and Trade

From Report of National Industrial Conference Board

AUTOMOBILE production in November, estimated to be 132,000 passenger cars and trucks in the United States and Canada, declined 15 per cent under output of October and is 42 per cent under output of November of last year.

Output for the first eleven months of the year was 39 per cent below what it was during the same period in 1929 and 23 per cent below the average eleven-month interval for the years 1925 to 1929.

Consumption of crude rubber for November amounted to 23,479 long tons, and represents a decrease of 14 per cent under October this year and 15 per cent under November a year ago. Consumption for the first eleven months of this year show a decrease of 21 per cent under the same period of 1929.

Stocks on hand November 30 amounted to 189,925 long tons, an increase of 2 per cent over October 31, 1930, and 106 per cent over November 30 a year ago.

Imports during November amounted to 31,765 long tons, a decrease of 27 per cent under October this year and 22 per cent under November, 1929.

The average price of crude rubber during November shows an increase of 1 cent a pound over October this year and a 7½ cents decrease under November a year ago.

Production of pneumatic casings for October is placed at 3,582,416, an increase of 6.4 per cent over the September figure of 3,365,444. The seasonal movement is normally downward. Production for October a year ago amounted to 4,611,480 casings.

Shipments of pneumatic casings for the first ten months of this year exceeded production by 4.3 per cent, whereas during the same period of 1929 there was no excess. Shipments of pneumatic casings for October amounted to 3,499,300 as compared with 4,405,176 casings in September, 1930, and 4,649,696 a year ago.

Inventories on hand October 31 amounted to 9,802,687 casings as against 9,811,764 on hand September 30.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

No.	Inquiry
1313	Manufacturer of small solid balls used on miniature courses.
1314	Manufacturers of boots and waterproofs for firemen.
1315	Manufacturer of machinery for covering channel rubber with fabric.
1316	Manufacturer of emery wheels ½-inch to 2 inches in diameter for the dental trade.
1317	Manufacturer of a soft sponge rubber hat cleaner.
1318	Correspondents wants to know where rubberrests can be obtained.
1319	Manufacturer of airplane tires.
1320	Manufacturer of bathing shoes.
1321	Manufacturer of rubber handled screw drivers.

A HELPER IN THE RUBBER ROOM WAS separating crude rubber. A piece of rubber snapped back, striking him in the eye and causing contusions, which, it is estimated, will disable him for 35 days. *National Safety News.*

The Rubber Industry in America

Goodyear Notes

President P. W. Litchfield announced that beginning January 5 the factory of The Goodyear Tire & Rubber Co., Akron, O., will revert to an eight-hour day basis five days a week. This change will permit a substantial increase in production without hiring additional men and give practically full time employment to Goodyear employes who have been working short time for several months. It is not likely that any additional men will be hired for some months to come, it was stated. The plant now works four six-hour shifts a day, and since July has been rotating jobs to keep as many of its experienced men on the payroll as possible.

Despite general business conditions. Goodyear production at Akron at its low peak reached 30,000 tires a day—a production figure that a decade ago was the high peak. The new schedule, however, will increase the tire ticket to 48,000 tires a day and 55,000 tubes.

Inventories of finished products are in more favorable position than a year ago and as low as they have been in several years compared to the volume of business. The upturn of production reflects the expected revival in demand for replacement tires as indicated by spring dating orders.

Important changes in the executive lineup of the Goodyear mechanical goods department recently were announced. W. C. Winings, assistant manager of the department, has been made manager, succeeding D. R. Burr, who becomes consulting manager of mechanical goods sales. Mr. Winings joined Goodyear fourteen years ago as a general line salesman at Indianapolis, Ind. Later he was transferred to the Chicago, Ill., branch as mechanical goods salesman. In 1926 he became manager of the Indianapolis branch. Two years later he was selected as one of two assistant managers of the mechanical goods department at Akron.

OHIO

W. C. Winings

G. A. Grauer continues as assistant manager of the department, working closely with Mr. Winings in handling the executive duties and operating functions of the department.

K. C. Zonsius, Goodyear branch manager at Peoria, Ill., since May, 1929, has been appointed assistant advertising manager to succeed J. A. Robertson, who resigned to reenter the advertising business in Chicago, Ill. Starting with the organization in May, 1917, Mr. Zonsius was assigned a general line sales territory. Then he joined the army. Upon his return he was transferred to the Chicago district office, later to general line sales work at Chicago, where in 1927 he was made assistant branch manager. In May, 1929, he was promoted to manager of the newly created Peoria branch. He has had wide experience in advertising, creating some extensive advertising programs for his dealers in the Peoria territory.

Mr. Zonsius has been succeeded at Peoria by V. Y. Bell, assistant branch manager at Milwaukee, Wis.

O'Neil on Capacity

William O'Neil, president of the General Tire & Rubber Co., Akron, O., believes that the success of any manufacturing company depends primarily upon its ability to estimate accurately its own capacity. The true meaning of the term "capacity", as applied to a manufacturing business, however, is often misunderstood.

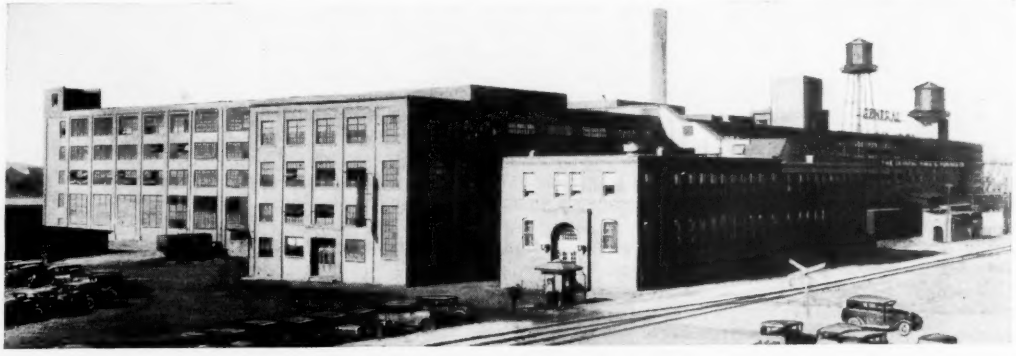
Is the real capacity of a rubber company the maximum number of tires that its men and its machines can turn out in a day, or a month, or a year, regardless of where those tires go, at what price they are sold if they are sold, or of what demand there happens to be for them?

Or, does plant capacity really mean the average number of tires produced in an average day or an average month, taking the entire year as the standard, for which there is a demand and which can be merchandised at a reasonable and legitimate profit?

That is true plant capacity; the other is merely machine capacity.

He further holds that mere volume for the sake of volume does not mean success in tire manufacturing; that huge contracts which require the maximum effort of men and machines for only limited periods are not good business unless enough of them are obtained to keep men and machines steadily employed; that large plant investment, with consequent large annual depreciation and interest charges, necessitates large output the year round if plant rentals are not to become exorbitant; and that, on the other hand, unless there is a demand for this large output, at a reasonable profit, it is an actual liability instead of an asset.

A. P. Regal, process engineer of The Philadelphia Rubber Works Co., Akron, O., is the news letter editor of the Rubber Section, National Safety Council.



View of One End of The General Tire & Rubber Co.'s Main Plant in Akron, O.

H. A. Hoffman

The Roessler & Hasslacher Chemical Co., Inc., Niagara Falls, N. Y., has announced that H. A. Hoffman has joined its staff as technical representative of its rubber division. He will cover the Akron and the midwestern districts. Mr. Hoffman was formerly with The B. F. Goodrich Co., Akron, and more recently chief chemist of The Mason Tire & Rubber Corp., Kent, O. Prior to joining the Goodrich company in 1910 he spent several years in the laboratories of Eli Lilly & Co., Indianapolis, Ind. He was born and educated in Indiana.

Ferriot Bros., Inc., 941 Yale St., Akron, is engaged exclusively in manufacturing molds, dies, and stamps for rubber manufacturers. The company specializes in molds for mechanical goods, druggists' sundries, hard and soft rubber specialties, heels and soles, mats, battery jar covers, toys, tank balls, brake lining, spring bumpers, shock insulators, and motor supports for automobiles, handle grips, and miniature tires. Ferriot specializes also in die sinking and steel engraving, including heavy duty steel stamps for tire mold stamping. The company likewise is prepared to design molds to produce any rubber article, even embracing all drafting work. The plant is equipped with the most modern machinery for this type of work. For seven years, until it was incorporated as Ferriot Bros., Inc., in June 1929, the firm had been a partnership known as Ferriot Bros. Die Sinking & Machine Co. Officers are G. H. Ferriot, manager and vice president; E. F. Ferriot, president; and A. A. Ferriot, secretary and treasurer. The present manager formerly was connected with the National Rubber Machinery Co., Akron, as supervisor of its mechanical mold division.

The Firestone Tire & Rubber Co., Akron, O., in its efforts to relieve unemployment notified from 750 to 1,000 former factory workers to return to their jobs. Horace R. Baker has resigned as Firestone advertising manager and is succeeded by Frank K. Starbird. E. A. Oberlin, Jr., and H. H. Hollinger last month were elected directors of the Firestone company, succeeding Lee R. Jackson and C. A. Myers. All four men are affiliated with the company. Mr. Jackson will continue as vice president in charge of sales. Homer A. Campbell has resigned as assistant treasurer. This position now held by W. D. Zahrt.

The Standard Oil Co. of Ohio now distributes Atlas tires and tubes through its service stations, following the lead of the Standard Oil companies of New Jersey and Indiana. The tires are made for the Atlas Supply Co. by the United States Rubber Co. and The B. F. Goodrich Co. Each company supplies 50 per cent of the requirements.

New Golf Ball Line

Wearever, No. 168, golf balls are of standard size and weight, retailing 3 for 50 cents. No. 416 is a lower priced ball of exceptional quality and value. They are products of The Faultless Rubber Co., Ashland, O.

MIDWEST

Labor Mitten Co., Dubuque, Iowa, markets rubber-faced mittens.

The United States Rubber Co., Tire Department, Detroit, Mich., will continue its long-established policy of giving dealers bonuses based on a certain volume of business, according to L. M. Simpson, general sales manager of the Tire Department. He also branded incorrect reports emanating from a convention of its district managers to the effect that this policy would be abandoned and a system of immediate discounts established in its place. Curtis L. Moody, formerly factory manager of Fisk Rubber Co., Chicopee Falls, Mass., is understood to be now in charge of production at the U. S. plant at Detroit.

NEW ENGLAND

Sibley-Pym Corp., Lynn, Mass., manufactures golf ball machinery, specializing in great circle thread winding machines.

Converse Rubber Co., Malden, Mass., of which the missing Mitchell B. Kaufman is president, has reduced its force by two hundred to three hundred employes because of the seasonal lack of orders. It was stated that the disappearance of the president has nothing to do with this lay-off, which is only temporary. According to Treasurer Frederick R. Allen, Converse is in a much better position regarding its employment situation than a large number of other rubber companies that have been affected by the current business depression.

L. G. Whittemore, Inc., manufacturer of chemicals, has announced its new address as 131 Beverly St., Boston, Mass.

Archer Rubber Co., Milford, Mass., has covered its 372 employes with a contributory type of group life insurance through a policy of the Prudential Insurance Co. of America. This $430,000 policy insures the workers in amounts from $1,000 to $4,000, according to rank or position held. The employes share with the company in paying the premiums.

E. C. Webster, traffic manager of the Hood Rubber Co., Inc., Watertown, Mass., recently was elected president of the Traffic Club of New England.

Devon Mills, New Bedford, Mass., tire fabric plant of The Goodyear Tire & Rubber Co., Akron, O., recently increased operations and will continue on a three-shift basis.

The Fisk Rubber Co. tire fabric plant in New Bedford, Mass., through the receipt of new orders covering 40 to 50 per cent of normal output, is able to continue operations instead of shutting down according to previous announcements.

Firestone Tire & Rubber Co. tire fabric plant in New Bedford, Mass., now operates three shifts daily, two of six hours each, and the regular night force, employing about 1,400. The company recently took on about two hundred more hands by reducing shifts from eight to six hours. A similar change resulting in increased personnel occurred in the Firestone Cotton Mills, Fall River, Mass.

Phillips-Baker Rubber Co., Providence, R. I., through a $390,000 policy of the Prudential Insurance Co. of America, has insured 373 employes in amounts from $1,000 to $3,000, according to rank or position held. This group life insurance is of the contributory type, with part of the premium paid by the company, and the remainder by the employes.

The Hitchcock Co., Inc., 31 St. James Ave., Boston, Mass., manufactures a new plastic self-vulcanizing rubber compound in paste form designed for resurfacing rubber belts, hoppers, agitators, chutes, and classifiers. This material, known as Covulc, is applied by spreading, and cures by exposure to the air.

"Anoroc," a new rubber insulation manufactured by the Simplex Wire & Cable Co., 201 Devonshire St., Boston, Mass., does away with corona and ozone troubles on insulated cables.

The Just Right Hardware Golf Tee Co., Harmon Pond, Me., was organized last month to manufacture golf balls and tees.

Clifton Mfg. Co., Jamaica Plain, Boston, Mass., manufacturer of waterproofs, has made its purchasing agent Miss Mae Crowley, for many years secretary to Manager N. Lincoln Greene.

A. J. Feiheit has resigned from Hodgman Rubber Co., Framingham, Mass., to join L. C. Chase, Boston, Mass., where he will specialize in the purchase and the styling of raincoat cloths.

C. D. Garretson, president of the Electric Hose & Rubber Co., Wilmington, Del., spoke at the Hotel Kenmore, Boston, Mass., recently at the twenty-fifth anniversary of the New England Association of Purchasing Agents.

Plant of The Seamless Rubber Co., New Haven, Conn.

EASTERN AND SOUTHERN

Zinc Oxide Sales Manager for St. Joseph Lead Co.

A five-year retirement could not dim the lure of an active business life. Consequently Edward Volney Peters, amid the pleasure and the satisfaction of his friends and his former business associates, once more resumes his activities in the rubber paint and allied fields, as sales manager of zinc oxide for the St. Joseph Lead Co., 250 Park Ave., New York, N. Y.

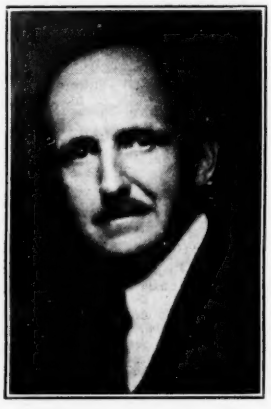
Mr. Peters became well known in the industry during his twenty-year association with the New Jersey Zinc Co. in New York. He joined that company in August, 1906, when he accepted a position in its purchasing department. In 1913 he became purchasing agent and in time was appointed assistant sales manager. Six years later he won the post of general sales manager. During the World War through the work of New Jersey Zinc Co., Mr. Peters performed valuable services for his own government as well as the Allies.

He began, however, his business career in the electrical department of the Manhattan railway system. His ability soon manifested itself, and at the end of a year he was put in charge of electrical purchases. Then in 1903 he organized a purchasing department for the engineering and contracting firm of J. G. White & Co., New York, and remained in charge there until 1906.

Mr. Peters was born in St. Louis, Mo., in 1881. But while he was still young, his family came East; and the boy completed his education at Greenville Academy, Greenville, N. Y.

The new sales manager is a man of excellent business judgment, noted for his ability to organize the sales units of a company into an energetic and profitable staff. He is fond of sports and when younger devoted himself to baseball and tennis. Now golf and motoring claim his attention.

For some time he served as president of the Flushing Country Club, Flushing, L. I. He is also actively connected with the National Paint, Oil & Varnish Association, of which he has been a director for eight years, and was too a vice president, and president in 1925-26. Mr. Peters, furthermore, was one of the men instrumental in organizing the National Association of Purchasing Agents.



Edward V. Peters

Hammill & Gillespie, Inc., importer and grinder of white minerals and earth colors, 225 Broadway, New York, N. Y., has located its new Manhattan warehouse "service" at Brooklyn Bridge Arch 14, Frankfort St., New York, N. Y.

The Anchor Packing Co. has announced the removals of its general offices, sales department, and warehouse all to 401 N. Broad St., Philadelphia, Pa.

Motor & Equipment Association will hold its annual banquet and show on January 7, 1931, on the Hotel Astor Roof, New York, N. Y. This affair will take place during the National Automobile Show Week.

Howell & Murchison, Inc., 230 Park Ave., New York, N. Y., is sales representative for the Georgia Kaolin Co., producer of Cherokee waterwashed and airfloated clay. R. W. Howell and David Murchison, formerly of the R. T. Vanderbilt Co., also at 230 Park Ave., are the principal members of the firm.

Hanover Rubber Co. Excelsior, Inc., about January 1, 1931, will open its new offices at 315 Fourth Ave., New York, N. Y. The company will act as sole agent in the United States and Canada for the Continental Rubber Works, Hannover, Germany, and will handle all transactions connected with that concern and its affiliated factories.

Binney & Smith Co. Activities

William B. Wiegand, research chief of Binney & Smith Co., 41 E. 42nd St., New York, N. Y., returned a few days ago from a brief business trip to Europe in the interest of the company.

Donald F. Cranor, Service Control Department, recently gave in Akron several repetitions of the exhibition of the six-reel moving picture on carbon black production, first shown at the December meeting of the New York Rubber Group. These exhibitions were by request because of the great educational interest of the picture to rubber chemists and technologists.

The Vanderbilt News

The R. T. Vanderbilt Co. has announced the early publication of a monthly magazine, *The Vanderbilt News,* planned by A. A. Somerville, vice president in charge of the rubber department of the Vanderbilt organization. The magazine will tell the story of work done in the company's laboratory.

William F. Russell, who will be the editor, was graduated from Royal Technical College, Scotland, and University of Jena, Germany. He has been identified for twenty years with chemical research in rubber. He was chief chemist of the Norwalk Tire & Rubber Co., Norwalk, Conn., from 1914 to 1928 and was its secretary for the past two years.

Mr. Russell is the author of papers on rubber chemistry and the variability of raw rubber and is the patentee of improvements in rubber vulcanization.

J. F. McCabe

J. F. McCabe, formerly with the New Orleans, La., office of the United States Rubber Co., recently joined the United Motors Service in the same city. This well-known company has now taken over the exclusive line of United States tires to round out its complete service to motorists. Mr. McCabe will have charge of this department, bringing to it his wealth of experience in that field.

Southern Brighton Mills, Shannon, Ga., manufacturer of woven tire fabrics, now operates five days a week.

Goodyear Clearwater Mill, Cedartown, Ga., subsidiary of The Goodyear Tire & Rubber Co., Akron, O., plans resuming for an indefinite time production on a full-time schedule of both its No. 1 local mill and its No. 2 mill at Rockmart, Ga.

Bureau of Labor Statistics, Department of Labor, Washington, D. C., in a recent survey comparing November, 1930, employment and payrolls with those of October, 1930, based on returns from 41,525 establishments with 4,712,082 employes whose combined earnings were $115,905,230 in a single week, reported a 2.5 per cent decrease in employment and a 5.1 per cent decrease in payroll totals. In November employment in tire manufacturing decreased 5.1 per cent. With comparisons on the basis of 100 being equal to the monthly average of 1926, the following are the index numbers of employment and payroll for the rubber boot and shoe industry and that of automobile tires and inner tubes. Boots and shoes: Employment, November, 1929, 99.1; October and November, 1930, 75.7 and 75.9; Payroll totals for the same periods, 103.0, 64.2, and 62.3. Tires and inner tubes: Employment, November, 1929, 82.2; October and November, 1930, 69.4 and 66.4; Payroll totals for the same periods, 72.5, 59.2, and 51.5.

The Roessler & Hasslacher Chemical Co., Inc., Niagara Falls, N. Y., on December 16, 17, and 18, specially chartered the Capitol Theatre for its special safety program, for its employes and their families. Motion pictures were shown, and awards made of silver cups and certificates to winning departments.

National Power Show

The Ninth National Exposition of Power and Mechanical Engineering was held in Grand Central Palace, New York, N. Y., December 1 to 6, 1930.

This exposition as usual was a comprehensive display of new developments in steam generation, pipes and fittings, electrical equipment, mechanical transmission, lubrication, recording and indicating, heating and ventilating, as well as many types of miscellaneous equipment.

Among the many exhibits of special interest to engineers of rubber manufacturing plants were the products of the following concerns:

Barco Mfg. Co., 1801 Winnemac Ave., Chicago, Ill. The Barco lubricated plug valves, which afford full direct port opening with one-quarter turn of handle or wrench, gives a smooth turning valve that can be throttled or opened wide at will.

The Bristol Co., Waterbury, Conn. A complete line of indicating and recording instruments and electrical instruments of improved design was shown.

Carrier Engineering Corp., 850 Frelinghuysen Ave., Newark, N. J. Three special features of this exhibit were the new centrifugal refrigerating machine, a radically different unit air conditioner, and the 1931 Weathermaker.

Garlock Packing Co., Palmyra, N. Y. A complete array of fibrous and metal packings and gaskets featured Garlock Chevron packing for severe service, and Garlock button hole tape, a new asbestos gasketing material.

Schwenk Safety Device Corp., 70 E. 45th St., New York, N. Y. It exhibited safety handling equipment for barrels, drums, and carboys for one-man safe handling of such packages.

Taylor Instrument Cos., Rochester, N. Y. A wide display of temperature and pressure instruments for power plants included as its special feature the new Tycos flush mounted instruments.

Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pa. This exhibit featured the complete line of Yarway tandem blow-off valves for all working pressures up to 2,000 pounds, also Yarway Hi-Lo Alarm water columns, inclined gages, cylinder guided expansion joints, and hydraulic valves of single and two pressure types.

Other exhibits of rubber plant engineering interest included those of Cleveland Worm & Gear Co., Cleveland, O.; General Electric Co., Schenectady, N. Y.; Link-Belt Co., Chicago, Ill.; Morse Chain Co., Ithaca, N. Y.; Okonite Co., Passaic, N. J.; C. J. Tagliabue Co., Brooklyn, N. Y.; and Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

The Pennsylvania Rubber Co., Jeannette, Pa., announces that C. P. Werner, former office manager of the New York branch, has been made eastern district credit manager; J. N. Averitt, former Chicago branch office manager, has been made western district credit manager; and R. P. Durdin has been advanced from office manager of the Atlanta branch to southern district credit manager.

Godfrey L. Cabot, Inc., carbon black manufacturer, 940 Old South Building, Boston, Mass., announces that under the plan voted unanimously by their employes at Pampa, Tex., each man will work eight hours per day five days per week instead of eight hours per day six days per week. In some cases this will result in a sacrifice of 15 per cent in wages. The sum distributed among the unemployed will total $2,400 per week. The company contributes 30 per cent of this amount, while the employes give 70 per cent.

Charles E. O'Connell, formerly with J. Frank Dunbar Co., has organized C. E. O'Connell & Co., 18 Burling Slip, New York, N. Y., to engage in a general rubber brokerage business.

The Goodyear Tire & Rubber Co., Gadsden, Ala., has announced that beginning January 5 it will increase production with the addition of about 100 workers. Output is to be increased from 5,400 tires to about 6,000 tires per day. Additional machinery is being placed in the finishing and stock preparation department.

Rubber Questionnaire

Third Quarter, 1930*

	Long Tons			
Reclaimed Rubber	Inventory at End of Quarter	Production	Shipments	Consumption
Reclaimers solely (7)	6,806	11,659	12,633	.....
Manufacturers who also reclaim (25)	7,746	19,618	6,475	15,377
Other manufacturers (80)	3,437	.....	.....	13,042
Totals	17,989	31,277	19,108	28,419

	Long Tons		
Scrap Rubber	Inventory	Consumption	Due on Contract
Reclaimers solely (7)	32,677	14,695	6,538
Manufacturers who also reclaim (21)	33,559	24,376	12,928
Other manufacturers (7)	127	.....	.....
Totals	66,363	39,071	19,466

Tons of Rubber Consumed in Rubber Products, and Total Sales Value of Shipments

Products	Crude Rubber Consumed Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries		
Automobile and motor truck pneumatic casings	50,540	$123,882,000
Automobile and motor truck pneumatic tubes	11,425	17,895,000
Motorcycle tires (casings and tubes)	58	268,000
Bicycle tires (single tubes, casings, and tubes)	264	679,000
Airplane casings and tubes	29	102,000
Solid and cushion tires	959	2,719,000
All other solid tires	69	272,000
Tire sundries and repair materials	1,009	3,541,000
Totals	64,353	$149,358,000
Products		
Other Rubber Products		
Mechanical rubber goods	4,246	$20,031,000
Boots and shoes	2,846	25,421,000
Insulated wire and insulating compounds	905	†5,802,000
Druggists' sundries, medical and surgical rubber goods	431	1,887,000
Stationers' rubber goods	282	478,000
Bathing apparel	85	371,000
Rubber clothing	201	1,411,000
Automobile fabrics	204	1,342,000
Other rubberized fabrics	750	2,385,000
Hard rubber goods	286	†1,555,000
Heels and soles	1,470	4,651,000
Rubber flooring	272	803,000
Sporting goods, toys, and novelties	612	2,737,000
Miscellaneous, not included in any of the above items	1,498	3,106,000
Totals	14,088	$71,980,000
Grand totals—all products	78,441	$221,338,000

Inventory of Rubber in the United States and Afloat

	Long Tons			
On Hand	Plantation	Para	All Others	Totals
Manufacturers	88,977	2,334	657	91,968
Importers and dealers	57,567	1,147	491	59,205
Totals on hand	146,544	3,481	1,148	151,173
Afloat				
Manufacturers	7,719	.....	.....	7,719
Importers and dealers	37,103	226	25	37,354
Totals afloat	44,822	226	25	45,073

* Number of rubber manufacturers that reported data was 176; crude rubber importers and dealers, 52; reclaimers (solely), 7; total daily average number of employes on basis of third week of July, 1930, was 136,243.

It is estimated that the reported grand total crude rubber consumption and the grand total sales value figures to be approximately 92 per cent; the grand total crude rubber inventory 90 per cent, and afloat figures 70 per cent; the reclaimed rubber production 96 per cent; reclaimed consumption 90 per cent; and reclaimed inventory 80 per cent of the total of the entire industry.

† One company did not report its sales, but did report crude rubber consumption, stocks, etc.

Compiled from statistics supplied by the Rubber Manufacturers Association, Inc.

NEW JERSEY

Some New Jersey rubber manufacturers report decreased business during the past month and a not very encouraging outlook. Tire and tube orders have been curtailed, and some manufacturers are operating only 50 per cent of capacity. Certain hard rubber goods plants are running normally; while others complain of declining business. The shoe and heel business remains good because of winter weather. The demand for brake lining is fair in some sections of the state.

United States Rubber Co., Passaic, N. J., through Factory Manager Edward C. Gruehl has announced the engagement of W. D. Stearns as employment manager to succeed Matthew P. Heffron, who recently resigned. The company also announces that Louis John De Holczer, formerly with the Gates Rubber Co., Denver, Colo., has joined its technical division. J. H. Hansen has been transferred from Detroit, Mich., to the Passaic plant, as supervisor of safety.

Rubber Manufacturers' Association of New Jersey recently held its annual meeting at the Trenton Club, Trenton, and elected officers for the coming year as follows: President, John A. Lambert, treasurer and general manager of the Acme Rubber Co.; Vice President, I. Ely Reed, vice president of the Mercer Rubber Co.; Secretary, Charles E. Stokes, Jr., vice president of the Home Rubber Co.; Treasurer, Horace B. Tobin, president of the Woven Steel Hose & Rubber Co. Preceding the election a dinner was held and a short talk on the rubber situation in general was given by A. L. Viles, vice president and general manager of the Rubber Manufacturers Association of America.

Essex Rubber Co., Trenton, reports that business is fair, and the future encouraging.

Murray Rubber Co., Trenton, announces the resignation of Harry E. Berrien, treasurer, and N. S. Conover, assistant secretary. Alfred A. Branham, vice president and general manager of the Murray company, is equity receiver. He states that the company is operating about 45 per cent capacity, with little change over the previous month.

Pierce-Roberts Rubber Co., Trenton, which has been running normally, has experienced a decline in business during the past month.

Mercer Rubber Co., Trenton, announces that orders for various kinds of mechanical goods are on the decline. The company's president, Fred Sayen, recently gave an interesting talk on the early rubber industry in Trenton at a meeting of the Sales and Advertising Managers of the Trenton Chamber of Commerce at the Stacy-Trent Hotel. The talk was followed by remarks by several other rubber manufacturers. Many rubber companies had displays at the meeting.

David A. Shirk

David A. Shirk, president of the Rare Metals Product Co., Belleville, on December 10 sailed on the *S. S. Belganland* for Shanghai, China. He will be away about four months. His purpose is to make a thorough study of the mining and the marketing of antimony metal in China.

The New Jersey Rubber Co., Lambertville, recently suffered a slight loss from a fire which started in the grinding department.

Whitehead Bros. Rubber Co., Trenton, reports good business in all departments with the plant operating a full week.

Puritan Rubber Co., Trenton, states that business has dropped off a little during the past month, but the same number of employes is retained.

Tire Production

Inventories of pneumatic casings on hand October 31, 1930, show practically no change as compared with September 30, 1930, according to The Rubber Manufacturers Association. This organization reports 9,802,687 casings on hand October 31 as against 9,811,764 casings on hand September 30.

Production of pneumatic casings for October is placed at 3,582,416, an increase of 6.4 per cent over the September figure of 3,365,444. Production for October a year ago amounted to 4,611,480 casings.

Shipments of pneumatic casings for the first ten months of this year exceeded production by 4.3 per cent; whereas during the same period of 1929 there was no excess. Shipments of pneumatic casings for the month of October amounted to 3,499,300 as compared with 4,405,176 casings in September, 1930, and 4,649,696 a year ago.

Treated Cartons Save Rubberware

Rubber goods are said to be saved from deterioration, especially by light, in cartons of cardboard having their inner surfaces treated with a film-forming size such as potato starch and alum containing a non-actinic dyestuff such as tartrazine and ponceau red.

J. Hauvette Michelin, who operated the Michelin Tire Co., Milltown, for many years, recently sailed on his annual trip to France with Mrs. Michelin and their two children. When he returns, he will take up his residence at 185 College Ave., New Brunswick. Before sailing Mr. Michelin said he was working to get a new industry in the Milltown plant. The Michelin factory was closed some time ago.

Edward L. Katzenbach, Trenton, is seeking a counsel fee of $5,000 from the estate of Joseph Oliver Stokes, late Trenton rubber manufacturer, who died in January, 1926, at his home in Santa Monica, California. He left an estate of $1,650,152.47. Argument on the counsel fee was heard in Mercer Court, Trenton, when decision was reserved. Mrs. Anna B. Stokes, widow of the rubber manufacturer, is contesting the fee. She received a fee of $89,265.53 as executrix, while her counsel was allowed $88,000.

The Thermoid Company, Trenton, continues to operate under normal conditions. It has been shipping brake lining and other products to European countries.

William J. B. Stokes, prominent Trenton rubber manufacturer, and **General C. Edward Murray,** president of the Crescent Insulated Wire & Cable Co., have each contributed $5,000 toward unemployment in Trenton.

The Thiokol Corp., Yardville, announces that Frank Kovacs, production manager of the Seiberling Rubber Co., Akron, O., has resigned to join the Thiokol concern as manager of sales and also to be in charge of the new development departments.

Sterling Tire Corp., East Rutherford, will be reorganized shortly as the Sterling Co. with offices at 15 Exchange Place, Jersey City. Alex A. Altaschuler will be the new president.

Stone Mountain Paper Mills, Inc., has purchased the largest and long idle building of the former United States Rubber Co. plant in New Brunswick, and will use it to manufacture paper specialties.

Tep-Ter Chemical Service Co., Inc., Wayne, has been organized by W. P. ter Horst and Jan Teppema. Mr. ter Horst was connected with the United States Rubber Co. laboratories at Passaic, and with the Rubber Service Laboratories Co., Nitro, W. Va. Mr. Teppema was on the technical staff of the C. P. Hall Co., Akron, O., also in the research laboratories of The Goodyear Tire & Rubber Co.

Lambertville Rubber Co., Lambertville, is operating full time. Officials say stormy winter weather will greatly boost the output of rubber boots and other footwear.

Luzerne Rubber Co., Trenton, reports that business in the hard rubber line has not shown any change during the past month.

PACIFIC COAST

While of late the tire situation on the Pacific Coast has been more satisfactory than for several months, many of the worst trade features having been much mollified, still retail dealers, while experiencing a gradual improvement in sales, are more or less apprehensive about the price outlook. Many are confident that prices will steadily get firmer with a corresponding improvement in net profits, but not a few believe that the next few weeks will again witness a renewal of the recent disastrous competition in which prices and profits were reduced close to the irreducible minimum. The tension is increased by unconfirmed reports that one and possibly two of the major tire producers will wage an exceptionally strong campaign for business in which too generous discounts and too easy terms will be used as an inducement to buyers. In practically all other lines than tires the rubber trade throughout nearly all the farwestern section reports business as being quite encouraging.

Pacific Goodrich Rubber Co., Los Angeles, Calif., announces that business is very good, not only in the eleven farwestern states covered by the company but in the overseas field; and beginning early in January production will again be markedly stepped up. R. E. Jeffers, heretofore merchandising manager, has been put in charge of advertising and sales promotion. He will be assisted by A. L. Fullwood, of the merchandising department, and E. A. Johnson, until recently of the Seattle, Wash., branch. R. J. Lummis has been transferred from the Denver, Colo., branch to the branch at San Francisco, Calif., and J. E. Bogue, assistant at the Los Angeles, Calif., branch, has been made manager of the Denver branch. The present output at the Los Angeles factory is about 3,000 tires and 4,000 tubes daily, and about 700 workers are in service as compared with 1,000 a year ago. Next month the number, it is said, will be much increased.

Firestone Tire & Rubber Co. of California is steadily increasing production at its plant in Los Angeles, according to Vice President and General Manager R. J. Cope, who feels confident that 1931 will be the best year in the company's history. Arrangements are being made for a considerable increase in daily output early in January. D. D. Spence, of the San Francisco, Calif., branch, has been appointed branch manager at Salt Lake City, Utah., replacing F. A. Yeamans, transferred to Reno, Nev.

The Official California Labor Market Bulletin for November, 1930, citing reports from representative manufacturing establishments employing about 60 per cent of the wage-earners of the state, announces that the number of operatives in the rubber industry was 33.9 per cent less in October, 1930, than in October, 1929; total wages paid, 30.4 per cent less; and average weekly earnings per worker, $27.55, or 5.4 per cent more.

Bought Spreckels Tire Machinery

President Douglas Radford, Vice President Charles Lamb of the West American Rubber Co., and Howard Gates, of Los Angeles, Calif., have bought from the estate of John D. Spreckels, of San Diego, Calif., the entire mechanical equipment of the Spreckels Savage Tire Co. in the latter city. After the making of tires had been discontinued several years ago by the Savage Co., the plant long remained idle although great care was taken meanwhile to keep the machinery in workable condition. Finally the Samson Tire & Rubber Co., Los Angeles, leased and operated the plant for many months as an auxiliary to its original factory in Compton, Calif., and up to the building of its present big works in Los Angeles. Recently the Spreckels estate had been considering an offer from eastern interests to take over both factory and equipment for a branch tire works, but, the deal failing to materialize, the estate concluded to accept the offer made by Messrs. Radford, Lamb, and Gates. The equipment is complete and considerable; the machinery includes twenty mills, three large calenders, five autoclaves extending 30 feet below ground, two 250 h.p. steam boilers, numerous tire-building machines and tire molds, heavy conveyers, etc., and originally cost many hundred thousand dollars. The buyers plan to use some of the machinery and dispose of the remainder.

United States Rubber Co. activities on the Pacific Coast are expected greatly to increase after January 1, when active operations in making and distributing its tires and other products are scheduled to begin at the plant of the Samson Tire & Rubber Corp., Los Angeles, Calif., recently acquired through a merger with the latter company. The Samson company will continue as an operating company, it is stated, and will still be headed by A. Schleicher, its originator and president. O. M. Chandler, United States Pacific Coast district tire sales manager, of Portland, Ore., recently visited Los Angeles.

Giant Rubber Co., 619 Upshur St., Portland, Ore., finds business steadily improving and the outlook good for 1931. The products include factory truck tires, band-saw bands, bumpers, sander pulleys, oil well swabs and packers, gaskets, pump and ball valves, rubberized bushings, port gum sheeted and stripped, recovered conveyer belting, hard and soft rubber-covered rolls, etc. The concern was formerly an incorporated company but was taken over some time ago by Edward J. Failing, who dissolved the company and now operates the plant under the former name.

Pioneer Rubber Mills, 345-353 Sacramento St., San Francisco, Calif., is gradually increasing production in nearly all departments at its large works in Pittsburg, Contra Costa Co., Calif. The export trade is said to be very encouraging. Chief products are light and heavy hose, conveyer and transmission belting, heels, packings, general mechanicals, and battery jars. The officers are: president, Geo. S. Towne; vice presidents, H. R. Mansfield (in charge of production) and D. D. Tripp (in charge of sales); secretary-treasurer, W. L. Reed; purchasing agent, K. E. Johnson; manager of industrial sales, Wm. R. Goudie.

Quaker City Rubber Co., Philadelphia, Pa., is experiencing much improvement in sales of belting, hose, packings, and other products in most of the farwestern territory covered by its Pacific Coast branch, of which J. T. Moore is manager with office and warehouse at 168-170 Second St., San Francisco, Calif.

Cascade Rubber Co., 35 W. Lander St., Seattle, Wash., specializes in manufacturing rubber-covered paper mill rolls, having exceptionally complete equipment for such products as well as for the recovering of such rolls. Improving conditions in the paper trade are expected soon to increase activity considerably at the rubber mills. Practically the only other product of the mills, according to Vice President M. D. Barash, is matting, which finds ready sale in the Northwest. The other officers are president, S. P. Barash, and secretary, H. P. Pratt.

American Rubber Manufacturing Co., Matson Bldg., San Francisco, Calif., according to Col. J. L. Dodge, vice president, is steadily increasing operations at its plant at Park Ave. and Watt St., Oakland, Calif., and expects a good general trade in light and heavy belting, many types of hose, and general mechanicals in 1931. The concern also does covering of paper mill rolls. The other officers are: president, N. S. Dodge; vice president, Geo. B. Dodge; and secretary, P. B. Harris, who recently took the place of S. Krattiger.

Kirkhill Rubber Co., 5811 S. Hoover St., Los Angeles, Calif., according to Secretary and General Manager T. Kirk Hill, has just installed a much larger boiler to take care of the increasing demands on its steam lines, and two additional hydraulic presses of much larger capacity than all others in its plant. The company makes hundreds of patented rubber specialties, one of the items in which it is particularly busy now is golf balls for the mail order and chain store trade. Business was much larger for December, 1930, than for the same month in 1929.

Seiberling Tire & Rubber Co., Akron, O., finds sales of tires and batteries steadily improving in the farwestern section, according to Pacific Coast Manager C. B. Reynolds, whose headquarters are at 475 Hoyt St., Portland, Ore. Mr. Reynolds visited Los Angeles during the holidays.

Rubber Club of Los Angeles, with headquarters at 1709 W. Eighth St., in the latter city, which was organized recently is making good progress, according to Geo. Bellis, secretary. The club

is composed of leading retail dealers of the Southwest and aims to correct such practices as allowing unreasonable discounts to buyers, offering excessive time for payments, allowing unfair values on trade-ins, and various unethical and unprofitable dealings.

Rubber Foot Artificial Limb Co., 6340 S. Passaic St., Huntington Park, Calif., has been formed to market a new surgical device consisting mainly of a wooden leg to which is attached a soft rubber lower section formed like a human foot, which is said to afford the wearer unusual comfort. The concern will be in operation in about a month and maintain a sales office in Los Angeles, Calif.

Goodyear Tire & Rubber Co., Los Angeles, Calif., had as a mid-December visitor Paul W. Litchfield, president of the parent Goodyear company of Akron, O. The company has been planning to go into full seasonal production after January 1. John K. Hough, sales manager, returned December 10, 1930, from Honolulu whither he had gone with C. B. Ault, who replaces J. B. Castleton in the management of Goodyear business in the Hawaiian Islands. Mr. Castleton after January 1 will be named, it is said, for an important post in the Goodyear service in the Pacific Coast section. He had been two years at Honolulu. Mr. Ault had spent the past ten years as Goodyear representative among car dealers and manufacturers and had specialized largely on aeronautic sales. His successor at the general office is Jack Paullin, until recently manager at Salt Lake City, Utah.

E. M. Smith Co., 637-639 Clarence St., Los Angeles, Calif., according to secretary-treasurer, W. G. Smith, is enjoying a generally good business in its staple products such as conveyer belting, heavy and light hose, brake blocks and lining, and general mechanicals. Demand is especially good for a patented rubber drill-pipe protector for oil wells.

Neversoil Rubber Products Co., manufacturer of Neversoil rubber specialties, 621 E. Ninth St., Los Angeles, Calif., is the new name of the California Rubber Products Co.

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
2840	Canadian Tire Exports, September, 1930.
2841	Canadian Tire Exports, First Nine Months, 1930.
2842	Final Report of Dealers' Stocks of Automobile Tires in the United States, October 1, 1930.
2849	British Exports of Footwear, September and First Nine Months, 1930.
2850	British Exports of Automobile Casings, September and First Nine Months, 1930.
2851	French Tire Exports, September and First Nine Months, 1930.
2852	French Footwear Exports, September and First Nine Months, 1930.
2853	Comparative Tire Exports from the United States, Canada, United Kingdom, and France, First Nine Months, 1930.
2854	Comparative Exports of Boots and Shoes from United States, Canada, and United Kingdom, First Nine Months, 1930.
2865	Domestic Renewal Sales of Automobile Casings.

CANADA

Booking of garden hose is now being done, as present prices are effective December 31. Orders taken before that date are protected against price change next season. According to manufacturers a good volume of business has been placed to date. Buying is apparently not general, as northern Ontario dealers are carrying over a fair stock on account of a wet season.

With the advent of the rainy season sales of rubbers, overshoes, etc., are now well underway in Vancouver, B. C. The zipper popularity is as strong as ever. Gumboots are selling well for children, but overshoes are the most popular, especially among the girls.

Whether cloth or rubber overshoes will be in greater demand depends upon the weather. Rubber lines will have the advantage if the weather is open and wet, but with dry snow the preference will be for cloth overshoes. Some dealers think the proportion will probably run fifty-fifty.

Entrance of the larger oil companies into the tire distribution field further complicates the problem that has been facing the rubber companies for years. The question as to which is the best of several methods of distribution, it is pointed out, has never been definitely established, with the result that competition among proponents of the various systems has cut profit to a point at which it is almost negligible. Independent dealers and dealer branches owned by rubber companies are the most profitable sources of tire income to the companies. With their sales decreased through the inroads of the oil companies buying in bulk, it is regarded as problematical whether rubber companies can keep their tire incomes at present levels. Carbon black imports into Canada in 1929 totaled 14,620,572 pounds appraised at $1,014,140, practically all from the United States. As ordinary gas black is not made in Canada, the imports should nearly represent the domestic consumption.

Donahue Corp. of Canada, Ltd., has taken over in St. Hyacinthe, P. Q., a new three-story brick building to manufacture, import, export, buy, sell, and otherwise deal in goods, wares, and merchandise of all kinds, including elastic webbing. Officers are A. J. Donahue, president; Harold M. Naramore, treasurer; and William West, managing director and secretary.

Viceroy Manufacturing Co., Ltd., Toronto, Ont., claims that it has the nearest approach to actual turf ever produced in the form of Viceroy rubber turf for miniature golf courses. A number of miniature courses in leading cities throughout the Dominion have been equipped with it, and we understand that at present three Toronto courses, two of which are complete and the third under construction, have specified this rubber turf.

Canadian Goodrich Co., Ltd., Kitchener, Ont., is conducting a Goodrich Zipper Christmas window display contest with prizes amounting to $175: first prize, $100; second, $50; and third, $25; for the best windows with which they present Zippers or other Goodrich rubber footwear as suitable merchandise for Christmas gifts. Every dealer who submits an acceptable photograph will receive either an inscribed cigarette lighter or a fountain pen.

The Panther Rubber Co., Ltd., Sherbrooke, P. Q., was among the 225 firms recently exhibiting at the National Produced-in-Canada Exhibition held in Montreal. The exhibition was sponsored by the Canadian Manufacturers' Association, Quebec Division.

McAllister Campbell succeeds W. H. Donovan as manager of the Halifax, N. S., branch of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont. He was formerly branch manager at Winnipeg, Man., and for the past year or more has been at the head office contracting with the motor car manufacturers on equipment business.

Miner Rubber Co., Ltd., Montreal, P. Q., will exhibit at the British Empire Fair to be held at Buenos Aires in the Spring. It is said that this company employs at its factory at Granby, P. Q., an average of 1,300 hands, that it sells goods in about seventy-five different countries, and that the factory has a yearly capacity of 4,500,000 pairs of footwear. President and General Manager W. H. Miner celebrated his fifty-first birthday on December 16. He is a director of many of Canada's leading industries, as well as the Rubber Association of Canada.

Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., offers a most complete line of garden hose that will meet the full range of requirements. It also offers paper wrapping protection and an extensive advertising campaign. The Goodyear Dealers' Bowling League of Vancouver, B. C., started its season with twelve teams of five players each of Goodyear dealers and their wives.

Imperial Oil, Ltd., Toronto, Ont., now sells Atlas tires and tubes at its various service stations throughout Canada, and it is anticipated that by the spring of 1931 these tires and tubes will be for sale in practically every city and town in Canada. The retail prices of this brand of tire is about 10 per cent below the prices of other standard lines. The greatest difference is apparent on the 29 by 4.40 size, which is a large seller for lighter cars. On this size the Atlas tire sells for $6.70 against $9.80 for other standard lines.

Changes in Bylaws

Members of the Rubber Exchange of New York have adopted a number of amendments and additions to existing bylaws pertaining to the proposed new A contract, which will go into effect on January 5 for deliveries on and after February 2, 1931; and also affecting the repeal of the present A contract at the end of December, 1931.

The members also approved amendments to the bylaws deleting the charge for interest on original margin requirements, additional provisions for suspension or expulsion of members, and disposition of proceeds from the sale of membership rights.

OBITUARY

Pioneer Rubber Man

THE American rubber trade has lost in the passing of William J. Kelly not only one of its pioneer rubber brokers, but also one of the most estimable figures in the industry. A born trader, keen, alert, and untiring, ever helpful and good-humored, and straightforward in all his dealings, he won the warm regard of a host of friends in all parts of the country. As a successful dealer and market authority, his counsel was eagerly sought by and generously given to tyro and experienced alike.

Born April 4, 1861, in Old Roxbury, Mass., Mr. Kelly's interest in rubber was early aroused. With his neighbor and schoolmate, the late Charles H. Arnold, he spent much time in boyhood around the old Boston Belting Co. factory in Roxbury. In later years the two as business associates sold to the factory much of its crude material. Mr. Kelly's commercial career began in the Boston office of Henry A. Gould in 1880. Soon after he took up with George A. Alden & Co. In 1903 he was induced by his boyhood chum, Mr. Arnold, to become a salesman for the latter. His popularity and efficiency won him later membership in the new firm of Arnold & Zeiss.

Some years later he went into business for himself in Boston and built up a considerable trade among rubber manufacturers, especially in the New England states. In February, 1893, he moved to New York and formed an alliance with DeLong, Betts & Co. Attracted to the manufacturing end, he became in June, 1896, manager of the Newton Rubber Works at Newton Upper Falls, Mass.; but three years later he returned to his first love, selling of crude, again taking up with the firm of G. A. Alden & Co., Boston. Convinced that a larger opportunity awaited him in New York City, he again went there and finally formed in 1919 the rubber brokerage firm of Poel & Kelly.

Mr. Kelly was one of the organizers of the old New England Rubber Club, was a director of its successor, the Rubber Association of America, and did much to promote the social as well as the business interests of both organizations. An ardent devotee of baseball and an excellent golfer, and taking a lively interest in various non-commercial activities, he was above all a model husband and father.

Waste Trade Executive

THE first president of the National Association of Waste Material Dealers, Theodore Hofeller, passed away at his home in Buffalo, N. Y., December 5, 1930. He was a native of Eichstettin, near Freiburg, Baden, Germany, and came to this country in 1873 when 15 years of age. He attended Buffalo public schools. Then he entered the clothing business with Oppenheimer & Co., in which concern he became a partner.

In 1881 he established in Buffalo the firm of Theodore Hofeller & Co., dealing in waste materials. He operated it for 35 years until its discontinuance in 1918.

He was interested in philanthropic activities all his life. One of his charitable acts was the establishment of the Theodore Hofeller Joy Fund endowment for hospitals and needy children.

Underwood & Underwood

William J. Kelly

FINANCIAL

Firestone Tire & Rubber Co.

TO THE STOCKHOLDERS: On behalf of the board of directors, I present herewith report for the fiscal year ended October 31, 1930.

The rubber tire industry is outstanding in the progress it has made in improved and economical manufacturing. With the machinery we have developed, which makes better and more uniform tires with savings in the waste of materials, one man can make ten tires today in the same time he took to make one tire seventeen years ago. The car owner, in turn, can today get the same tire value for $1 that cost him $10 at that time.

However, the industry has met with great difficulties in the fluctuations in the prices of its raw materials—rubber and cotton. These fluctuations are the greatest menace to consistent and satisfactory earnings. This condition has been unusually severe the past year. The price of crude rubber dropped over 70 per cent during the year, and the price of cotton over 35 per cent. These reductions, together with the general depression, excess manufacturing capacity, and over-organization, have caused unusual price cutting in the industry.

Our sales were $120,015,663, which is 17 per cent less than last year. We are glad to advise you that by readjusting our organization and reducing our expenses in every phase of our business, and after writing down our inventories to market prices, absorbing our expenses in organizing and establishing one-stop service stores, establishing and developing our battery business and the expense in connection with our rubber growing in Liberia —and after providing for depreciation, interest, Federal taxes and all charges, we show a net profit for the year of $1,541,034.

Our program in establishing one-stop service stores has given us knowledge and experience that has been of great help to us and our dealers in building a larger retail business along more economical lines and at more stable prices. We believe this, in no small measure, accounts for the fact that while it is estimated there are 25,000 less tire dealers today than there were two years ago, we succeeded last year in securing 6,928 new dealers who joined with us. We have established over 400 one-stop service stores and have invested in them approximately $25,000,000 in land, buildings, and working capital. These are separate corporations in which we have financial control. While we will continue to establish these one-stop service stores where it is found necessary and profitable to do so, this will be on a very conservative scale.

We now have 43,000 acres planted in rubber in Liberia and have an additional 10,000 acres cleared. We will plant 5,000 acres this coming year with budded stock that we now have in our nurseries, and maintain the area we already have planted, keeping our expenses in Liberia to a minimum. We feel that no matter at what price rubber will be sold in the future we can produce it in Liberia as cheap as or cheaper than it can be produced in any other rubber-growing country.

We are not contemplating any further plant extensions, but we did find it necessary to establish a plant in South America with a capacity of 1,000 tires and tubes a day. We have purchased land in the Argentine, at Buenos Aires, and we plan to have the plant built and in operation by May 1, 1931.

The great problem today of every manufacturer is to merchandise and distribute his products more economically. We have made great progress the past year in this respect by readjusting our merchandising and distributing system and by material reductions in all of our expenses.

With our inventories written down to market prices, which are the lowest in history, and with a loyal and ambitious organization that has a better understanding of its problems than ever before, we are looking forward to a very satisfactory year.

HARVEY S. FIRESTONE,
President.

Akron, O.
December 5, 1930.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Aetna Rubber Co.	Pfd.	$1.75 q.	Jan. 1	Dec. 15
Baldwin Rubber Co.	Cl. A	$0.37½ q.	Dec. 31	Dec. 20
Dominion Rubber Co.	Pfd.	$1.75 q.	Dec. 31	Dec. 20
Firestone Tire & Rubber Co	Com.	$0.25 q.	Jan. 20	Jan. 5
Firestone Tire & Rubber Co.	6% Pfd.	$1.50 q.	Mar. 2	Feb. 13
General Tire & Rubber Co.	Pfd.	$1.50 q.	Dec. 31	Dec. 20
Goodyear Tire & Rubber Co. of Cal.	Pfd.	$1.75 q.	Jan. 2	Dec. 20
Goodyear Tire & Rubber Co. of Can	Com.	$1.25 q.	Jan. 2	Dec. 15
Goodyear Tire & Rubber Co. of Can	Pfd.	$1.75 q.	Jan. 2	Dec. 15
Stedman Rubber Flooring Co	Pfd.	$1.75 q.	Jan. 2	Dec. 26

The Rubber Industry in Europe

GREAT BRITAIN

Estate Outputs

The *India Rubber Journal* in publishing estate outputs for October observes that many companies are no longer reporting their crops with the same promptitude as in the past and suggests that some are probably having figures transmitted by mail instead of by cable. At all events, although the date of publishing the data has been postponed, the paper in question was able to collect information from 398 companies only, as against 424 reported on for September. The results of the compilation show the first general decrease in outputs, the totals being 3.11 per cent below the total for October of the preceding year, while it also shows a reduction as compared with September, 1930. The 243 Malayan companies in all produced 19,536,242 pounds in October, 1930, 19,509,915 pounds in October, 1929, and 20,021,824 pounds in September, 1930. The Malayan output, therefore, is practically stationary. The 39 Java companies show an increase of 7.48 per cent for October, 1930, as compared with the corresponding month of 1929, and 10 companies in India and Burma show an increase of 7.23 per cent. In regard to the latter, however, it should be noted that this increase comes after a decrease of 13.65 per cent in September.

The most marked differences are to be found in Ceylon, where 58 companies produced 19.66 per cent less in October, 1930, than in October, 1929, and in Sumatra, where the decrease for 38 companies was 16.94 per cent. The 10 companies of Borneo and Sarawak produced 3.05 per cent less. The total outputs of the 398 companies came to 14,871 tons in October, 1930, against 15,339 tons in October, 1929, and 15,157 tons in September, 1930. The change that has taken place since September, 1930, may be judged from the fact that in that month the total crop harvested by 424 companies showed an increase of 11.34 per cent over the crop obtained in September, 1929.

Institution of Rubber Industry

The first annual dinner of the West of England Section of the Institution of the Rubber Industry was scheduled for December 10, 1930, with Sir Herbert Blain in the chair, and Eric Macfadyen guest of honor.

At a meeting of the council held on November 14, 1930, the following firms were elected manufacturing members of the Institution: India Rubber, Gutta-Percha and Telegraph Works Co., Ltd.; I. T. S. Rubber Co.; McKechnie Brothers, Ltd.; Turner's Asbestos Cement, Ltd. In addition S. Cartwright & Son, Ltd., and Hilton, Wallace & Co., Ltd., were elected as merchant members, together with seventy-two ordinary members and one junior member.

Diploma Members. The following members, who had successfully passed the examination held on July 7, 1930, were elected associates. Associateship (Science): Dr. C. L. Nottebohm, H. M. D. Wilson, T. H. Tetlow, and K. C. Chen. Associateship (General Rubber Technology): A. E. Lever.

Midland Section held a meeting on November 25 when C. F. Hawkins read a paper on "The Elimination and Utilization of Waste." On December 9, 1930, the Midland Section held its sixth annual general meeting at Birmingham to elect the committee. After the election a paper entitled "Everyday Inventions in Tires and Wheels" was read by W. Bond.

The seventh annual meeting of the London and District Section of the Institution of the Rubber Industry was held on December 1, 1930, for the election of officers and committee. At the conclusion of the business a paper on "Chemical Aspects of Vulcanization with and without Sulphur" was read by Dr. van Rossem.

New Rubber Goods

The triple-stud tread design of Dunlop tires is to be used on fashionable shoes for women for winter wear. It is argued that the design, which has stopped the skidding of automobiles on greasy roads, can be relied on to stop the skidding of human beings on greasy sidewalks.

Some manufacturers of waterproofs are showing garments for spring which exploit tweed effects in the way of cloth designs. As to the materials themselves, rayon fabrics and cotton velvets lead where novelty is the aim. Incidentally, experiments are being conducted to use rayon velvets for proofed coats. With regard to styles, one firm has put out capes, another uses small shoulder capes on coats; others show novelty rayon garments piped and trimmed with broad bands of contrasting colors. In general, belts are higher and are broader.

Passing from feminine finery to matters more prosaic, we mention a new product in which ground waste rubber has been incorporated which is intended to be used together with Portland cement as a substitute for mastics, compo, and magnesite floors, for hard and flexible putty, expansion joints, wallboard, plastic decoration, tank linings, tile cement, floor repairs, etc. This material, known as Liqualino, is put on the market by Cement Industries, Parcel Terrace Works, Derby.

The McLeroth Tube

The McLeroth Tube is divided by flexible rubber walls into separate compartments which communicate with one another by small feed tubes having circumferential air passages which in turn communicate with the valve. When a burst takes place in a compartment, the escape of air from that compartment causes pressure on the adjacent walls, which are forced together, thus expelling the remaining air and nipping the small feed tube, effectually shutting off the damaged compartment. In this way all risk of the tire collapsing is prevented.

Other advantages claimed for this tube are: its massive construction and the fact that it is under compression in the cover render it less liable to puncture; the division into compartments gives a non-skid effect, for the normal pressure is exerted between divisions only, and the result is that the tire travels with a caterpillar action and has a greater grip on the road than a tire with standard inner tube; as the air is confined in compartments, it is not necesary to inflate to a pressure of more than 70 per cent of normal, and thus greater cushioning effect is obtained. Finally a much lighter type of cover can be used with this inner tube since the tension on the cover cords is subdivided to the distance of the sections from one another.

A bus company was requested to test some tubes in covers which had already run 60 to 70 per cent of their normal mileage. This test was made, and on one bus they have now run 21,000 miles and on another, 23,000 miles.

Arrangements for putting the tube on the market have not yet been completed, but they are obtainable from McLeroth Pneumatic Tires Ltd., 25-31 Moorgate, London, E. C. 2.

Company Notes

Rissik Fraser & Co., Ltd., manufacturer of synthetic resin molding powders, Factory Lane, Croydon, Surrey, will be sold. Lease of the premises, good-will, plant and machinery, office furniture, stock-in-trade, etc., are included in the sale.

The India Rubber, Gutta-Percha & Telegraph Works Co., Ltd., reports a net loss of £95,977 for the year ended August 31, 1930. A large part of the loss is due, it is stated, to the writing down of raw materials and stocks to the extremely low values at present ruling. Realizing early in the year the downward trend of trade conditions, the directors undertook a policy of drastic reorganization, and consequently W. F. Lloyd, one of the directors, was appointed a joint managing director of the company last June. Overhead charges have been substantially reduced, and the selling organization has been strengthened. The reorganization, of course, could not take place without a number of dismissals, but in cases of long and loyal service, the directors are acting as generously as conditions permit. The changes made are already giving good

results, and the directors are satisfied that the company's prospects have materially improved.

J. Livermore & Son, Clapton, manufacturer of rubber pouches, etc., has celebrated its one hundredth anniversary.

Unemployment in the rubber industry in Great Britain again increased during October. On October 27, 1930, 12.7 per cent of insured persons were wholly unemployed, and another 4.2 per cent were temporarily out of work. The total unemployment rate was 16.9 per cent. This rate compares with 16.3 per cent at the end of September, 1930, and 8.9 per cent a year ago.

A Memorial Tablet. On December 9, 1930, Sir William Coates unveiled a memorial tablet on the wall of the premises of 26 May Street, Belfast, Ireland, where the first pneumatic tire to be adopted commercially was made by John Boyd Dunlop, a veterinary surgeon, who in 1888 took out a patent for it. John Boyd Dunlop, it may be remembered, died in Dublin in 1921.

The London Corp.'s Chairman of Streets Committee, at a meeting stated that rubber companies were being approached with the purpose of ascertaining whether prices, at present prohibitive, could not be reduced for paving St. Paul's Churchyard with rubber.

The first rubber sound screen recently was installed in the Stoll Moving Picture Theater, London. It is made of thin sheet rubber, about 1/50-inch, with a pure white surface, and has the usual perforations. Its size is 34 by 29 feet and it weighs only 5 pounds more than the old screen it displaced. The screen, which is of American manufacture, is said to have improved greatly the quality and the resonance of sound production; while the pictures show up much more clearly. The rubber screen is more expensive. But since it can be sponged when necessary and need not be sent away for washing, it will outlast two of the older type.

European Notes

France. Imports of hard and soft rubber goods from the United States into France, although they represent a comparatively small value, deserve notice because of their rapid growth during the last few years. Whereas the total values of these goods in the year 1928 came to $140,673, by 1929 this had increased to $178,429 while for the first six months of 1930, the value was $140,778; that is, six months' imports in 1930 were greater than those for the entire year 1928 and not far behind those for the whole of 1929.

Gloves, druggists' sundries, toys and balls, bathing caps, rubber bands, erasers, hospital sheeting, hard rubber for electrical purposes and other hard rubber goods, all seem to be finding increasing favor with the French. On the other hand, there has been a sharp drop in the imports of hot water bottles and syringes, and shipments of

(*Continued on page* 98)

GERMANY

Declining Business

Business conditions in Germany as yet show no signs of improving. The number of unemployed continues to increase and at the end of October, 1930, came to 3,320,413, which is 1,692,974 or 104 per cent more than in the preceding year. Naturally the rubber industry feels the repercussion of this condition and chambers of commerce reports for several rubber manufacturing centers are gloomy.

In the Lower Saxony and Kassel districts activities began to fall off during July and have steadily declined since then, resulting in dismissal of workers and part-time schedules. Manufacturers find that despite the fact that prices have been pared down until profits form a negligible quantity, the home demand continues to shrink, while high tariffs abroad, and political disturbances in China, South America, and India cause a further drop in the export trade.

Wholesale dealers complain of hand-to-mouth buying on the part of retailers and, what is worse, of the tendency to place orders direct with manufacturers, for whom, it appears, no amount is too small.

The elastic webbing branch is probably the most afflicted, in no other section of the rubber industry is underselling being carried to such extremes as here and the evil results are clearly reflected in the numerous failures that have taken place of late. Usually the Xmas season with its special demand for novelties in elastic goods livens up the industry, but this year holiday orders have been irregular and spasmodic and altogether insufficient to keep factories fully occupied.

The difficulties, however, are forcing manufacturers to be constantly on the lookout for something new in the way of designs or novelties. One large elastic manufacturing firm is putting on the market elastic belts for men into which tiny strips of leather have been woven, giving the belts the appearance of leather. Snake and lizard skin designs seem to be particularly successful.

New Rubber Goods

To counteract the tendency of the edges of rugs to curl, and to prevent rugs and mats from slipping on polished floors, rubber suction disks which firmly grip the floor have have been designed. The disks are attached to the rugs by snap-fastenings.

The Thuringer Schlauchweberei und Gummiwerke, Waltershausen, has patented a rubber plaque in which a perforated metal plate has been imbedded. The rubber and metal plaque, which is intended to be used in floorings, can be permanently bent in any desired fashion. Since the metal is vulcanized with the rubber, the chance of either material loosening is practically eliminated.

A woman has designed garments to protect the body, knees, and shins of hockey and football players. The novelty of these articles is that tiny round air-filled or sponge rubber balls or ovals have been used for padding them. A safety cushion for those indulging in water sports is filled with oval balls and can be sewn into the bathing suit. The device conforms to the body but does not give a clumsy appearance and is very flexible. The advantage of these articles is said to be that they do not lie flat against the body, as only parts of the balls touch the body, permitting freer radiation of body heat.

A rubber ball that emits squawks or other sounds when tossed about is made up of an outer, slightly elastic cover over a softer, highly elastic bladder in which the sound producers have been arranged. The latter project somewhat and fit into holes in the outer cover thus anchoring the inner bladder. In the center of the ball is a weight from which radiate springs pressing the inner bladder against the walls of the ball.

Company Notes

The Continental Gummi-Werke A. G., Hannover, financial position as of September 30, 1930, was stated at a directors' meeting to be as follows: Amount with banks, 10,689,949 marks; debtors in Germany, 19,130,273; debtors abroad, 7,968,-903 marks; stocks in Germany, 13,578,-278 marks; stocks abroad, 4,530,441 marks. Altogether the liquid funds amount to 55,897,844 marks, while the firm owes various creditors a sum which, including the amount due in taxes, comes to 11,543,437 marks. Owing to the present condition of the market for raw materials, nothing definite was said about dividends.

Referring to negotiations between German and foreign tire manufacturers regarding tire prices, and a sales policy, it was stated that no decision had as yet been reached. Since no fewer than 25 tire factories are competing in the relatively restricted German market, and each is out to increase its share, a satisfactory solution of the matter for the new year will be extremely difficult to find. However, the firm contemplates the further development of affairs with assurance in view of its sales and manufacturing organization.

It may be mentioned that up to October of this year, the firm's sales in Germany showed a decrease of 16 per cent as compared with the same period of the preceding year; exports were maintained at the same height as the previous year but prices were very low.

The Deutsche Kabelwerke A. G., Berlin, report shows a similar trend—sales greater than the preceding year, but prices lower. For the first nine months of the current business year, the quantity of goods sold shows an increase when compared with results obtained during the same period of the year before, but the amount of money received for the goods shows a decrease of 10 per cent, the reason for this being that prices had to be considerably reduced. However, owing to improved equipment and methods, the number of employes could be reduced by ten per cent so that costs remained about the same as the year before in spite of the higher output. The company has sufficient orders on hand to keep the works occupied for several months.

The Rubber Industry in the Far East

MALAYA

A Plantation Pool

Details have become available of the scheme for pooling the resources of thirteen rubber plantation companies of which B. B. Ridsdel & Co. is secretary, which is now in operation. The companies concerned have a total capital of £1,126,535 and outputs aggregating 5,033,238 pounds a year.

In June last the secretaries and agents, on behalf of all the companies, entered into forward contracts for the sale of a total of 50 tons of rubber a month until the end of 1931 at a guaranteed average minimum of 7d. per pound, but with no maximum, subject to an allowance to buyers of ½d. a pound if the average market price for the month preceding the month of shipment is 7½d. or more per pound.

The scheme is based upon the profit from the forward contracts being pooled for the benefit of the companies concerned; while the rubber required to fill the contracts is to be produced only by the companies selected for the purpose, leaving the other companies free to stop tapping or to produce other rubber subject to any profit being pooled. The scheme is intended to be in force until the end of 1931.

To the profit from the forward contracts will be added a sum which is estimated with the profit to be sufficient to cover bare maintenance costs to the end of 1931, the additional sum to be contributed by the parties in equal shares; while the fund thus provided will be allocated to the non-producing companies in agreed proportion.

All directors' fees are reduced from October, 1930, to the end of 1931 by one-third to one-half, and secretarial fees are reduced by about 33⅓ per cent. The administration of the scheme is vested in a joint committee appointed by all the directors of the companies from among their number; this committee is to act without remuneration. Subject to the powers vested in that committee, each individual board of directors will retail full control of its own company's affairs.

Each company may produce rubber besides that required for the forward contracts subject to paying all proceeds of sale in excess of an agreed sum per pound into a special fund which is to be distributable among all the companies in proportion to the quantity of rubber produced and sold by each of them.

At the end of 1931 some of the companies will have drawn more from the joint fund than they have contributed and will be in debt to this fund; while the remainder, including the producing companies, will be creditors of the fund. It is estimated that the total of the amounts thus payable to the joint fund will offset the total of the amounts payable out of the funds, and any deficiency will have to be borne by all the companies in proportion to the amounts owed by them or to them respectively.

Reduction of Outputs

So far 80 estates have announced their intention of closing down altogether or of curtailing output. A well-known Stock Exchange firm has published a list of these firms together with their normal outputs and revised outputs. In all, the outputs of these 80 companies would have totaled 29,531 tons; but by adopting a restrictive method of tapping, the total becomes 18,984 tons or a total reduction in output of 10,647 tons. Naturally, this reduction will be a more or less gradual affair and the effect will, therefore, not be immediately apparent.

While some shareholders laud these steps as self-help, others, of course, find something to cavil about. One suggests that sound companies which are announcing their intentions to reduce outputs are encouraging weak concerns and the natives to continue tapping full out; whereas what the strong companies should do is to state that they intend producing to capacity, and then the weaker concerns, having no one to take the chestnuts out of the fire for them, would naturally have to look to the job themselves. This person evidently thinks that the full-out policy pursued hitherto by the companies intending to restrict had the effect of keeping down the outputs from the weaker companies and that for that reason rubber prices did not sink any lower.

Another argument put forward against individual restriction of outputs is that this causes great disorganization and dispersion of labor and that when the market rises to a remunerative level, intense competition for labor will arise in Malaya. To this argument the reply seems to be that in the first place drastic conditions need drastic remedies; second, that if estates are forced to go slow in spite of a rising market because they have not enough tappers to produce to the limit, this condition is all to the good, for otherwise the least tendency of the market to go up would immediately be counteracted by the flood of rubber that would be sent forth by companies anxious to recoup their losses as soon as possible; third, that in so young an industry as the rubber planting industry, the planters still have much to learn and that, by their own experience; finally, one is reminded of the well-known story of the man, the boy, and the donkey and what happened when the humans tried to follow all the advice given to them.

Remillers Closing Down

The closing of the remilling plants of Chin Seng Hong is announced in the local press. This firm has two plants with a total of 88 mills and ranks second to Tan Kah Kee. From reliable sources it is also learned that the Chee Song Rubber Co., which has a remilling plant with 20 mills, has also shut down. Linking this information with what is learned regarding Dutch East Indian native rubber, it would appear that if natives are ceasing to tap owing to the low prices prevailing and that the reduced supplies are affecting remillers, it is equally true that many natives are as eager as ever to sell their crop for what it will bring, but that the Chinese remillers do not find the business worthwhile at present rates.

To a certain extent then, the reduced shipments from the natives of Sumatra and Borneo must be ascribed to the unwillingness of the Chinese to buy rather than to the decision of small holders not to produce. Such being the case, an increasing number of natives will be finding themselves with undisposable rubber on their hands, and it will be interesting to see whether this circumstance will force the natives to produce rubber more nearly approaching European standards in regard to cleanness and appearance, or whether larger numbers of small holders will follow the example already set and cut out their rubber in favor of rice or other crops.

Ceylon

Sodium Bisulphite and Plasticity

From the report on the effect of adding sodium bisulphite to latex on the plasticity of crepe, in *The Tropical Agriculturist*, October, 1930, G. Martin and L. E. Elliott state that in order to determine the maximum effect of bisulphite on plasticity of crepe, three samples were prepared of which one contained no bisulphite, one the usual amount added on estates, and the third, double that amount. On arriving in London the samples were tested for hardness at 100° C., and as in previous tests, the hardness of the samples was found to be proportional to the amount of bisulphite added to the latex.

As the plasticity of rubber undergoes considerable change when stored, portions of the samples were stored at 32°F and 60°F for six months and again tested for hardness and plasticity. It was found that the bisulphite makes the crepe difficult to masticate; the temperature of storage, however, had little effect on the hardness or masticating properties of the samples.

Chemical tests were carried out to determine whether there is any relation between the hardness of the samples and (a) the amount of mineral matter present, (b) the amount of moisture in the rubber, and (c) the acidity of some of the non-rubber accessory substances. But these investigations did not suggest a definite reason for the hardening due to bisulphite. A study of the effect on the hardness of crepe of compounds similar and related to bisulphite has been arranged, which it is hoped will furnish more definite information on the subject.

NETHERLANDS EAST INDIES

Hevea Yield Figures

In the November issue of the *Archief v. d. Rubbercultuur,* C. Heusser gives detailed data concerning the yield figures of legitimate Hevea seedlings obtained in 1929 in the experin ental gardens at Soengei Pantjoer.

The communication covers the results of tapping seedlings from crosses made in 1920, seedlings from isolated seed gardens and seedlings from crosses made in 1923.

The seedlings from the 1920 crosses are planted in a garden of 8 2/3 hectares in area (hectare = 2.45 acres). The yield in the fourth tapping year from this area was 5,905.8 kilos, or 681.3 kilos per hectare, the number of trees tapped per hectare was 159. In all, 206,751 tappings were made so that the average yield per tapping works out at 28.56 grams, while the yield per tree per annum was 4.31 kilos (kilo = 2.2 pounds). In the same year the crop from illegitimate seedlings used as control was 385 kilos per hectare. The number of trees per hectare was 200, the average yield per tapping, 12.5 grams, and the average annual yield per tree, 1.89 kilos.

The family 157 by 164 again gave the highest yield, 7.26 kilos per tree per annum; the family 164 by 161 came next with an average annual yield per tree of 6.84 kilos. On the other hand results from the family 49 by 26 were disappointing; the yield was almost 1 kilo below the average per tree per annum.

Individual Trees

The differences in productive capacity which individual trees develop as they grow older are even more marked than those of the families. Very few of the trees which at the end of the first tapping year had been selected as the best yielders maintained their position in the succeeding three tapping years. On the other hand some of the best producers in the fourth year were not conspicuously high yielders in the first two years. This observation makes the selection of mother trees for continued selection still more difficult, particularly as it is not yet known whether periods of high productivity will in future alternate with periods of decreased yields, nor whether the site of the trees has anything to do with the matter. Therefore, there is nothing to do but continue experimenting with a large number of trees and to test the parent trees by their offspring, despite the certainty that much of this work is useless.

The highest yield during the fourth tapping year was obtained from tree No. 352; namely, 18.24 kilos. Curiously enough this tree yielded only 1.11 kilos (below the average, which was 1.20 kilos), during the first tapping year. Tree No. 324, belonging to the same family, yielded 17.89 kilos in the same year, but was attacked by brown bast, and it is feared that No. 352 will eventually succumb also to the disease since the family seems to be susceptible to the disease. Tree No. 317 is very promising although its yield was only 14.59 kilos.

Incidentally 6 per cent of the trees have had brown bast since tapping was begun.

Isolated Gardens

The isolated gardens were planted with selected buddings, and the seed obtained from these gardens again planted. The yields obtained from these seedlings show as great variations as the crosses, if not greater. In a number of families a large proportion of the trees produced from nil to 10 grams per tree per tapping, the majority from 10 to 20 grams, while only 1 or 2 of each family yielded over 30 grams per tree per tapping. It is a curious and significant fact that some of the best yields were obtained from seedlings planted from seed of clones, which were subsequently rejected as unimportant. There was the clone 135 which was cut out after experimental tapping showed that these buddings produced less than clone 49, which was planted in the same isolated plot. The seed obtained from this clone and planted out gave very satisfactory results; the average output in the first tapping year was 8.5 grams, and the output in the second tapping year 17.3 grams, while two trees yielded more than twice the average.

Something similar happened with the clone 26 which was removed after its crop of seed had been obtained. The averages obtained from the seed from this clone and its probable cross with 36 are very high, but owing to the limited number of trees, the data can hardly be used for purposes of comparison. Nevertheless, it is interesting to note that No. 375 produced 20 grams per tapping in the first tapping year, and 45.1 grams in the second year, while No. 376 produced 15.4 grams in the first year, and 50.2 grams in the second tapping year.

Artificial Pollinations

In 1923 artificial pollinations were carried out in Avroslaan experimental garden on the best seedlings obtained from illegitimate seed from selected trees of Tjinta Radja. The percentage of successes, 12 per cent, was fairly high, and in all 35 trees were planted during October-December, 1923. These developed very well, and by the fifth year all except two trees had reached the tapping stage. Here again great differences in productivity of the different families were noted; however, owing to the small number of trees comparisons are not very important.

The average yields per tree per tapping for the five- and six-year-old trees were 13.1 and 21.7 grams, which are high, considering the age of the trees.

The five best trees gave remarkably high yields in the second tapping year, the outputs per tree per tapping during that period having been 50.7 grams, 57.2 grams, 42 grams, 41.3 grams, and 32.7 grams, respectively. The best yielder of the five gave an average of 62.7 grams in April, 1929, 67.0 grams in August, 1929, and 61.3 grams in October, 1929.

Bark renewal of these trees is satisfactory, and none of the trees have so far shown signs of brown bast.

Conclusion

The yield figures for the seedlings investigated are considerably higher than the yields from ordinary seedlings of the same age; in fact the results from the best families approach and even equal those from the clones in use today. By selective thinning out it is expected that the average yield will be raised still higher, as may be judged from the fact that of the 1920 crosses, the best 10 per cent averaged 60 grams; the best 20 per cent, 51 grams; the best 30 per cent, 46.5 grams; the best 40 per cent, 43 grams; the best 50 per cent, 40 grams; while the average for all the trees was 28.5 grams.

South India

The *Indian Trade Journal* of September 18, 1930, gives details regarding area and production of rubber in India during 1929. At the end of that year 3,390 plantations covered an area of 252,767 acres as against 2,782 with an area of 245,907 acres in the preceding year. From available data it appears that new lands planted with rubber during the year came to 8,668 acres; while the areas of old cultivation abandoned were 4,820 acres, a net total of 3,848 acres over the total planted area of 167,058 acres in 1928.

In 1929 the total areas under rubber amounted to 170,906 acres, 2 per cent above the area of the previous year, and of this amount only 112,177 acres were tapped. More than half the area under cultivation, or 53 per cent, was in Burma, 30 per cent in Travancore, 9 per cent in Madras, 6 per cent in Cochin, and 2 per cent in Coorg and Mysore.

The total output of raw rubber in the year under review was 28,022,842 pounds of which 302,433 pounds were Ceara, 15,783 Ficus, and the rest Hevea, against a total of 26,839,332 pounds the year before when Ceara came to 64,278 pounds, and Ficus 38,613 pounds.

There was a general increase in production except in Madras, which showed a decline of 8 per cent. The yield per tapped acre shows an improvement for some districts although on the whole the showing is not very good. The yield from Cochin worked out at 317 pounds against 280 pounds per acre; from Travancore, at 266 instead of 260 pounds; from Burma, 235 instead of 239 pounds; in Madras 228 pounds instead of 240 pounds; in Coorg, 195 against 174 pounds; and for Mysore the extremely poor figure of 38 instead of 20 pounds per acre.

The total stock of dry rubber held on December 31, 1929, was estimated at 5,607,992 pounds as compared with 5,854,148 pounds on the same date of 1928.

The exports abroad came to 25,700,000 pounds of which 46 per cent went to the United Kingdom, 23 per cent to Ceylon, 21 per cent to Straits Settlements, and 6 per cent to the United States.

Patents, Trade Marks, and Designs

Machinery

United States

1,780,112.* **Mill Adjusting Device.** The safety plate is so incorporated that the mill rolls may be adjusted without affecting the functioning of the safety means if the mill should become overloaded. R. H. Bowman, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,780,208.* **Pump Member.** A flexible tire inflating device that may be rapidly manufactured at low cost with a reenforced flexible stem and metallic parts and reenforced sucker foot integrally united with it. V. V. Messer, New York, N. Y., assignor to Seiberling Rubber Co., Barberton, O.

1,780,769.* **Sole Presser.** This presses the sole in place and turns its margin onto the upper in the same operation. C. M. Richardson and V. H. Bodle, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

1,781,393.* **Tube Mold.** An upright individual vulcanizer for producing endless tire tubes in circular form thus eliminates splicing required when inner tubes are formed on straight or curved mandrels. R. W. Hutchens and A. R. Krause, assignors to Gillette Rubber Co., all of Eau Claire, Wis.

1,781,398.* **Bicycle Tire Trimmer.** This provides for a spreading core adapted to spread out a tire carcass into position for trimming its edges, and a quick acting mechanism for swinging the operating parts out of the way. A. R. Krause, assignor to Gillette Rubber Co., both of Eau Claire, Wis.

1,781,650.* **Cable Bead Machine.** A bead ring is composed of several wire strands equally stretched and secured against relative movement. The ring also has interstices for accommodating rubber as binding material within the strands of wire cable. H. R. Teegarden, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

*Pictured in group illustration.

1,781,658.* **Solid Tire Mold.** A device for molding and curing solid or cushion tires equipped either with or without an adapting member. P. Keller, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,781,665.* **Tire Casing Remover.** This invention provides simple means for automatically removing tires from the molds as they pass along on the conveyer from the vulcanizers. R. D. Hulslander, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,781,817.* **Thread Tension Device.** This covers improved means for applying tension to rubber threads while they are being covered with yarn, and a feeding device for controlling the degree of tension to be applied to the threads that shall be necessary for operating the feeding mechanism. C. F. Kenyon, assignor to Columbia Narrow Fabric Co., both of Shannock, R. I.

1,782,107.* **Making Inlaid Sheets.** A means is provided for rapidly and economically making in continuous lengths a sheet of inlaid plastic floor covering in predetermined lines and colors. M. C. Teague, Elmhurst, N. Y., assignor to Mechanical Rubber Co., Cleveland, O.

1,778,848. **Strand Working Machine.** C. A. Dame, Providence, R. I.

1,779,376 and 1,779,377. **Tire Former.** W. E. Swern, Kokomo, Ind., assignor, by direct and mesne assignments, of one half to Fisk Rubber Co., Chicopee Falls, Mass., and one half to Goodyear Tire & Rubber Co., Akron, O.

1,779,385. **Vulcanizing Apparatus.** W. F. Wirgman, Jr., and M. E. Tedrow, assignors to Goodyear Tire & Rubber Co., all of Akron, O.

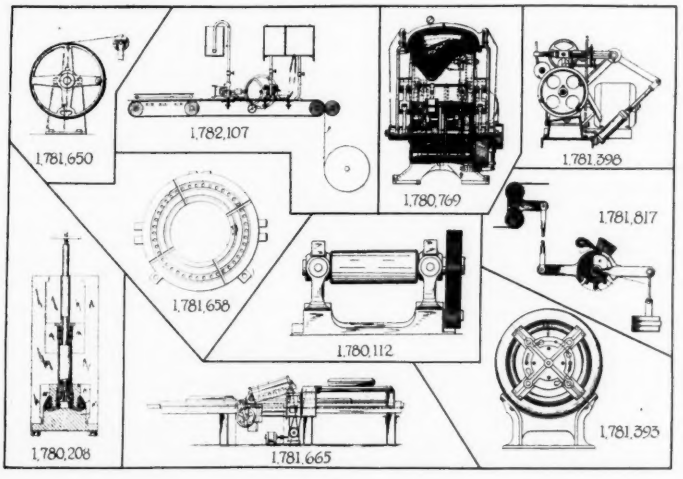
1,779,396. **Tire Vulcanizing Mold.** P. Keller, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,399. **Tire Builder.** J. A. Shively, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,813. **Inner Tube Form.** E. Hazell, New York, N. Y., assignor to Morgan & Wright, Detroit, Mich.

1,780,016. **Cutter for Teat Cup Liners.** J. L. Hulbert, Poughkeepsie, assignor to De Laval Separator Co., New York, both in N. Y.

1,781,285. **Tread Applier.** H. T. Kraft, assignor to Goodyear Tire & Rubber Co., both of Akron, O.



Dominion of Canada

305,134. **Rubber Impregnated Sheeting.** Brown Co., assignee of G. A. Richter, both of Berlin, N. H., U. S. A.

305,176. **Calender Roll.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. Finn, Detroit, Mich., U. S. A.

305,177. **Tire Manufacturing Device.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. O. Abbott, Detroit, Mich., U. S. A.

305,178. **Shaping Flat Built Casings.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.

305,179. **Tire Manufacturing Device.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of R. F. Ternes, Detroit, Mich., U. S. A.

305,637. **Calender.** P. E. Welton, Cuyahoga Falls, O., U. S. A.

305,665. **Extruding Machine.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of W. A. Gibbons, Great Neck, L. I., and E. Hazell, New York, both in N. Y., U. S. A.

305,667. **Rubber Article Form.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of B. H. Foster, Maplewood, N. J., U. S. A.

United Kingdom

333,952. **Sponge Rubber Mold.** Dunlop Rubber Co., Ltd., London, G. W. Trobridge, E. A. Murphy, D. F. Twiss, and W. G. Gorham, all of Fort Dunlop, Birmingham.

333,973. **Ball Painting Machine.** Dunlop Rubber Co., Ltd., London, H. Willshaw, S. N. Goodhall, and C. Folliss, all of Fort Dunlop, Birmingham.

334,049. **Molded Golf Ball Trimmer.** India Rubber, Gutta Percha & Telegraph Works Co., Ltd., and F. E. Brown, of India Rubber, Gutta Percha & Telegraph Works, Silvertown, both of London.

334,179. **Sole Adhesive Applier.** British United Shoe Machinery Co., Ltd., W. Holmes, and C. H. James, all of Leicester.

334,509. **Plasticator.** Farrel-Birmingham Co., Inc., Ansonia, assignee of W. A. Gordon, Shelton, both in Conn.

334,601. **Tire Vulcanizing Mold.** J. Ferguson & Sons, Ltd., and A. S. Welch, both of Surrey.

334,655. **Tire Mold.** Aluminium, Ltd., Toronto, Canada, assignee of G. W. Bungay, Plainfield, N. J., U. S. A.

334,657. **Tire Repair Vulcanizer.** Dunlop Rubber Co., Ltd., London, and P. C. Oxborrow, Southampton.

334,658. **Tire Repair Vulcanizer.** Dunlop Rubber Co., Ltd., London, H. Willshaw, and T. Norcross, both of Fort Dunlop, Birmingham.

334,725. **Tire Retreading Rotary Rasp.** H. Williams, St. Peters, South Australia.

334,925. **Tire Fabric Cutter.** Dunlop Rubber Co., Ltd., London, and H. Willshaw, Fort Dunlop, Birmingham.

Germany

511,679. **Press for Balls.** Chas. Macintosh & Co., Ltd., Manchester, England. Represented by R. and M. M. Wirth, C. Weihe, and H. Weil, all of Frankfurt a.M., and T. R. Koehnhorn and E. Noll, both of Berlin S. W. 11.

Designs

1,141,595. **Vulcanizing Tongs.** C. Assall, Duisburg-Miederich.

1,141,704. **Sole Vulcanizing Mold.** A. Wagener, Berlin-Charlottenburg.

1,141,766. **Dentists' Vulcanizer.** Dentalmaschinenfabrik G. m. b. H., Berlin-Tempelhof.

1,142,336. **Vulcanizing Mold.** M. Szurau, Berlin-Charlottenburg.

1,142,793. **Tire Splitter.** Maschinenfabrik Moenus A. G., Frankfurt a. M.

1,143,338. **Vulcanizing Press.** A. Heyer, Taucha.

1,143,637. **Sole Vulcanizing Mold.** A. Wagener, Berlin-Charlottenburg.

1,144,403. **Brush for Roughening Rubber, etc.** Schulz & Treppenhauer, Dresden A.

Process

United States

1,778,841. **Electrodeposition of Rubber.** W. A. Williams, Edinburgh, Scotland.

1,779,244. **Building Tires.** A. J. Musselman, Akron, O.

1,779,368. **Causing Article Adhesion.** J. Cavanagh, Cohasset, Mass., assignor to United Shoe Machinery Corp., Paterson, N. J.

1,779,388. **Coating Fabrics.** W. C. Calvert, Evanston, Ill., assignor to Goodyear Tire & Rubber Co., Akron, O.

1,779,391 and 1,779,392. **Constructing Tires.** B. Darrow, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,400. **Building Tires.** W. E. Shively, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,772. **Rubberized Paper.** E. Hopkinson, New York, N. Y., assignor to Mechanical Rubber Co., Cleveland, O.

1,780,122. **Continuous Sponge Rubber Production.** B. B. Felix, Chicago, Ill., assignor to Featheredge Rubber Co., Inc., a corporation of Ill.

1,781,370. **Reenforced Rubber Plates.** H. Debor, Munich, Germany.

1,781,657. **Pneumatic Tire.** R. E. Jenkinson, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

Dominion of Canada

305,633. **Toothed V-Type Belts.** R. Roderwald, Berlin, Germany.

305,879. **Vulcanized Athletic Shoe.** Endicott Johnson Corp., Endicott, assignee of L. L. Steed, Johnson City, both in N. Y., U. S. A.

United Kingdom

333,871. **Pressing Leather.** C. G. Shaw, Huntsville, Ont., Canada.

333,879. **Extruding Plastic Material.** W. S. Smith, Devonshire, H. J. Garnett, Sevenoaks, and J. N. Dean, Orpington, both in Kent.

333,909. **Vehicle Bumper.** H. C. J. Carrington, Birmingham.

334,695. **Vulcanizing Tires.** Industrial Process Corp., Albany, N. Y., U. S. A.

334,840. **Electric Cable Insulation.** W. S. Smith, Devon, H. J. Garnett, Sevenoaks, and J. N. Dean, Orpington, both in Kent.

Germany

511,836. **Depressing Vulcanized Sheets.** Firma Gustav Bartsch, Hamburg.

512,507. **Fabric Block Belts.** R. Roderwald, Berlin-Grunewald.

Chemical

United States

1,779,258. **Fungus and Waterproof Material.** F. A. McDermott, Claymont, and F. J. Funk, assignors to E. I. du Pont de Nemours & Co., both of Wilmington, all in Del.

1,779,375. **Accelerator.** L. B. Sebrell, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,390. **Age Resister.** A. M. Clifford, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,715. **Accelerator Manufacture.** W. Scott, assignor to Rubber Service Laboratories Co., both of Akron, O.

1,779,808. **Adhesive Composition.** W. A. Gibbons, Little Neck, assignor to General Rubber Co., New York, both in N. Y.

1,779,846. **Proofing Composition.** I. M. Jacobsohn, Chicago, Ill., and S. Truscott, Birmingham, O.

1,780,149. **Accelerator.** D. H. Powers, Penns Grove, N. J., assignor to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,780,157. **Composite Lubricant.** J. A. Higgins, assignor to E. Higgins, both of St. Joseph, Mo.

1,780,326 and 1,780,334. **Antioxidant.** I. Williams, and W. B. Burnett, both of Pittsburgh, Pa., assignors, by mesne assignments, to E. I. du Pont de Nemours & Co., Wilmington, Del.

1,780,604. **Accelerator.** W. Scott, Nitro, W. Va., assignor to Rubber Service Laboratories Co., Akron, O.

1,780,636. **Accelerator.** C. M. Stine, assignor to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

1,780,657. **Aqueous Dispersion.** W. B. Pratt, Wellesley, Mass., assignor, by mesne assignments, to Dispersions Process, Inc., Dover, Del.

1,781,306. **Age Resister.** J. Teppema, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,781,492. **Vulcanization Process.** W. A. Boughton, Cambridge, Mass.

1,781,645. **Emulsified Composition.** L. Kirschbraun, Leonia, N. J.

1,781,649. **Uniting Rubber to Metals, Etc.** L. B. Sebrell, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,782,036. **Heat Plastic Composition.** H. Gray, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,782,111. **Process for Making Accelerators.** H. S. Adams, Larchmont, N. Y., and L. Meuser, Bound Brook, N. J., assignors to Naugatuck Chemical Co., Naugatuck, Conn.

1,782,112. **Treating Amine Mixtures.** H. S. Adams, Larchmont, N. Y., and L. Meuser, Bound Brook, N. J., assignors to Naugatuck Chemical Co., Naugatuck, Conn.

1,782,140. **Rubber Derivative.** H. L. Fisher and H. A. Winkelmann, both of Akron, O., assignors to B. F. Goodrich Co., New York, N. Y.

Dominion of Canada

305,161. **Coating Composition.** Canadian Industries, Ltd., Montreal, P. Q., assignee of C. Coolidge, Wilmington, Del., and H. E. Eastlack, Parlin, N. J., both in the U. S. A.

305,186. **Rubber Colors.** I. G. Farbenindustrie A. G., Frankfort a. M., assignee of C. Neubauer and R. Krech, both of Mannheim, all in Germany.

305,454. **Preparing Rubber Substances.** I. G. Farbenindustrie A. G., Frankfort a. M., assignee of E. Tschunkur and W. Bock, both of Köln-Mulheim, all in Germany.

305,664. **Vulcanizing Rubber.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of S. M. Cadwell, Leonia, N. J., U. S. A.

305,666. **Treating Rubber.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of S. M. Cadwell, Leonia, N. J., U. S. A.

305,668. **Treating Rubber.** Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of S. I. Strickhouser, Passaic, N. J., U. S. A.

305,679. **Waterproof Sheet.** Flintkote Co., Boston, Mass., assignee of L. Kirschbraun, Leonia, N. J., both in the U. S. A.

United Kingdom

333,872 and 333,894. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

333,901. **Rubber Substitute.** E. W. Hultman, Los Angeles, Calif., U. S. A.

333,941. **Antioxidant.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

334,009. **Accelerator.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

334,184. **Synthetic Rubber.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

334,232. **Impregnating Fibrous Material.** I. J. Novak, Bridgeport, Conn., U. S. A.

334,361. **Imitation Leather.** O. G. Bohlin, Helsingborg, Sweden.

334,554. **Synthetic Rubber.** A. Carpmael, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

334,581. **Rubber Electrophoresis.** Dunlop Rubber Co., Ltd., London, R. G. James and D. F. Twiss, both of Fort Dunlop, Birmingham.

334,587. **Purifying Rubber.** W. S. Smith, Devon, H. J. Garnett, Sevenoaks, J. N. Dean, Orpington, both in Kent, and H. C. Channon, S. Kensington, London.

334,688. **Rubber Colors.** Imperial Chemical Industries, Ltd., Millbank, London, A. J. Hailwood, W. J. S. Naunton, A. Stewart, and A. Shepherdson, all of Blackley, Manchester.

334,693. **Rubber Paint.** W. E. Frith, Dover.

334,871. **Rubber Electrophoresis.** Siemens & Halske A. G., Siemensstadt, Berlin, Germany.

334,958. **Synthetic Rubber Tire Compositions.** I. G. Farbenindustrie A. G., Frankfort a. M., Germany.

334,961. **Synthetic Rubber Composition.** J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort a. M., Germany.)

Germany

512,599. **Treating Latex.** I. Traube, Berlin-Charlottenburg 5.

512,659. **Preserving Rubber.** Naugatuck Chemical Co., Naugatuck, Conn., U. S. A. Represented by W. Carsten and C. Wiegand, both of Berlin S. W. 11.

512,747. **Oil Proof Mixing.** Firma Tokyo Gomu Kabushiki Kaisha, Tokio-Fu, Japan. Represented by A. Mestern, Berlin S. W. 48.

513,316. **Dental Rubber.** C. Joannides, Constantinople, Turkey. Represented by R. Linde, Berlin S. W. 48.

513,429. **Vulcanizing Method.** E. Wlceck, Berlin-Oberschoneweide.

General

United States

17,859. (Reissue). **Inner Tube Patch.** C. E. Dunlap, Sioux City, Iowa.

17,860. (Reissue). **Tube Bevel-Cut Patch.** J. G. Gross, San Gabriel, Calif.

1,778,927. **Paving Block.** C. Wright, assignor to Wright Rubber Products Co., both of Racine, Wis.

1,778,953. **Heel.** J. F. McNamara, Chicago, Ill.

1,779,014. **Tire Interliner.** R. Schäfer and A. Meier, both of Berlin, Germany.

1,779,187. **Push Ball.** H. C. Pearson, Pasadena, Calif.

1,779,235. **Resilient Support.** F. L. Haushalter, Akron, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,779,329. **Electric Circuit Controller.** H. Panzetta, Watford, England.

1,779,344. **Windshield Wiper.** E. B. Tarver, Lakewood, assignor to Medina Rubber Co., Medina, both in O.

1,779,354. **Footwear Antisplash Device.** J. E. Blincow, Wolverhampton, England.

1,779,389. **Gasproof Balloon Fabric.** C. M. Carson, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,779,395. **Gas Cell Material.** K. Huerttle, assignor to Goodyear-Zeppelin Corp., both of Akron, O.

1,779,397. **Fuel Tank.** H. T. Kraft, assignor to Goodyear-Zeppelin Corp., both of Akron, O.

1,779,421. **Check Valve.** O. C. Cox, Chicago, Ill.

1,779,553. **Atomizer.** C. L. Marcus, New York, N. Y.

1,779,573. **Tire Valve Insides.** J. Volckhausen, Weehawken, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,779,592. **Hose.** H. W. Goodall, Alden, Pa.

1,779,616. **Gasket.** F. J. Oven, Chicago, Ill., assignor to Victor Mfg. & Gasket Co., a corporation of Ill.

1,779,620. **Toy.** A. L. Romero, San Francisco, Calif.

1,779,663. **Nonmetallic Coupling.** R. F. Cowell, Teaneck, N. J., assignor to International Motor Co., New York, N. Y.

1,779,675. **Vaporproof Hand Lamp.** F. C. Kollath, Chicago, Ill.

1,779,689. **Tire Lug.** T. W. Bechtold, assignor to G. E. Maurer, L. Le Veque, and J. W. Gearhart, all of Freeport, Ill.

1,779,907. **Puncture Locating Device.** E. R. Dye, Monticello, Ind.

1,779,995. **Golf Tee.** R. Trane, Omaha, Neb.

1,780,155. **Washing Device.** F. A. Hahn, E. Moline, Ill.

1,780,306. **Tire.** C. M. Manly, deceased, Kew Gardens, N. Y., by J. M. Manly, Chicago, Ill., B. M. Manly, Washington, D. C., and W. G. Manly, Columbia, Mo., executors, assignors to Overman Cushion Tire Co., Inc.

1,780,420. **Wind and Water Excluder.** R. A. Flint, Malad, Idaho.

1,780,502. **Windshield Ice Eliminator.** C. R. Otto, Edmond, Okla.

1,780,639. **Bottle Capping Machine.** E. S. Burdick, Milwaukee, Wis., L. B. Byrne, Portland, and F. W. Chausse, Salem, both in Ore.

1,780,701. **Photographic Printing Device.** R. F. Crane, Cincinnati, O.

1,780,724. **Engine Support.** C. R. Short, assignor to General Motors Research Corp., both of Detroit, Mich.

1,780,727. **Coupler.** P. L. Tenney, Muncie, Ind., assignor to General Motors Corp., Detroit, Mich.

1,780,748. **Litter Gathering Device.** A. H. Fisher, E. Cleveland, assignor to H. B. Sabin, Cleveland, both in O.

1,780,850. **Golf Ball Washer.** C. W. Strong, Portland, Ore.

1,780,851. **Plug Cap.** H. L. Strongson, New York, N. Y.

1,780,908. **Pneumatic Bumper.** H. M. Clausen, Spokane, Wash.

1,780,997. **Cushioned Heel.** W. M. Cohan and M. N. Ratzan, both of Brooklyn, N. Y.

1,781,071. **Typewriter.** E. H. Moyle, Los Angeles, Calif.

1,781,113. **Golf Ball Washer.** E. M. Laing, Highland Park, Ill.

1,781,161. **Refrigerator Adjustable Mounting.** J. O. Carrey, assignor to Carrey-Morse Engineering Co., both of St. Louis, Mo.

1,781,197. **Shoe Construction.** G. A. Schroeter, Brooklyn, N. Y., assignor of one half to C. E. Heckel, Cincinnati, O.

1,781,253. **Railway Vehicle Bogie Truck.** A. Spencer, London, England.

1,781,403. **Ship's Fender.** C. T. Lyons, Medina, assignor to Durable Mat Co., Seattle, both in Wash.

1,781,504. **Fountain Pen.** W. C. Ford, Andover, Mass.

1,781,631. **Vehicle Snubber.** R. B. Fageol, Los Angeles, Calif.

1,781,750. **Conveyer.** H. C. Dodge, Portland, and W. H. Beane, Klamath Falls, both in Ore.

1,781,842. **Bathing Cap.** T. J. Howland, Long Branch, N. J.

1,781,896. **Bias Insulating Tape.** H. I. Diamond, Atlanta, Ga.

1,781,931. **Heel.** W. A. Owen, Akron, O.

1,782,041. **Elastic Webbing.** J. Hirsch, Yonkers, N. Y., assignor to Kops Bros., Inc., a corporation of N. Y.

1,782,091. **Spring Shackle.** T. L. Fawick, Racine, Wis.

1,782,183. **Necktie.** N. J. Strauss, Lynbrook, assignor, by direct and mesne assignments, of one-third to Freydberg Bros., Inc., New York, both in N. Y., and two-thirds to J. Silberman and L. Kahn, trading as Resisto Mfg. Co., both of Baltimore, Md.

1,782,198. **Football.** J. R. Denkert, Johnstown, N. Y.

1,782,254. **Ball Game.** M. Breidenbach, Mainz, Germany.

1,782,332. **Embalmer's Plug.** C. L. Arnold, Shelbyville, Ky.

1,782,354. **Cotton Picking Sack.** W. R. Keene, Ruleville, Miss.

Dominion of Canada

305,028. **Necktie.** M. Halpern, New York, and W. Mayer, Brooklyn, co-inventors, both in N. Y., U. S. A.

305,087. **Blackboard Eraser.** A. P. Reed, Toronto, Ont.

305,279. **Window Cleaner.** M. and J. Häupel, co-inventors, both of Wien VII, Austria.

305,293. **Soap Holder.** J. Balestra, Bronx, N. Y., U. S. A.

305,433. **Tire Gaging Device.** La Compagnie Industrielle et Commerciale Du Cycle et De L'Automobile, Paris, assignee of C. Dunois, Champigny, both in France.

305,532. **Separable Fastener.** F. Waschiczeck, and O. Schubart & Sohn, assignee of half interest, both of Naumburg, Saale, Germany.

305,593. **Pneumatic Cushion.** A. V. Mellano, Thames Ditton, Surrey Co., England.

305,779. **Trouble Lamp Bracket.** R. Garbs, Kankakee, Ill., U. S. A.

305,824. **Vacuum Cleaner.** A. Townsend, Sydney, N. S. W., Australia.

305,826. **Infants' Rest and Exerciser.** O. P. Welch, St. Ignace, Mich., U. S. A.

305,899. **Resilient Container.** Goodyear Tire & Rubber Co., assignee of B. C. Everhard, both of Akron, O., U. S. A.

305,900. **Conveyer Belt.** Goodyear Tire & Rubber Co., assignee of R. S. Carter, both of Akron, O., U. S. A.

United Kingdom

333,870. **Leather Pressing Device.** C. G. Shaw, Huntsville, Ont., Canada.

333,892. **Electric Lamp Holder.** J. R. Pullon, Holborn Circus, London.

333,895. **Gramophone Pickup.** Lissen, Ltd., and R. P. Richardson, both of Isleworth, Middlesex.

333,944. **Aircraft Wheel Shock Absorbers.** T. Sloper, Devizes, Wiltshire.

333,969. **Aircraft Spring Suspensions.** L. F. Austing, Kingsway, London.

333,994. **Vaginal Syringe.** H. N. Stahl, Altona-on-Elbe, Germany.

334,057. **Bottle Stopper.** Industria Astur Soc. Anon., and M. Mata, both of Gijon, Oviedo, Spain.

334,094. **Suspenders.** A. Hücking, Elberfeld, Germany.

334,120. **Electric Lamp.** D. G. G. Jones, Compton, near Wolverhampton.
334,123. **Stocking Protector.** T. Tersch, Potsdam, Germany.
334,160. **Universally Mounting Wheels.** O. Suhner, Brugg, Aargau, Switzerland.
334,185. **Tobacco Pipe.** C. P. Marsh, Wells, Somersetshire.
334,221. **Submarine Mine.** J. K. M. Harrison, Ogontz, Pa., U. S. A.
334,314. **Brushes Combined with Pads.** J. H. Brown, Rayleigh, Essex.
334,349. **Hot Water Bottle.** E. C. W. Wolters, Hamburg, Germany.
334,352. **Inflatable Toy.** L. and I. Dorogi, and Dr. Dorogi És Társa Gummigyar, R. T., all of Albertfalva, Budapest, Hungary.
334,373. **Mechanical Toy.** E. Wincott, Brixton, London.
334,417. **Perambulator Shock Absorber.** B. Simpson, and H. B. Murdoch, of Simpson, Fawcett & Co., both of Hunslet, Leeds.
334,422. **Teapot.** M. Cutts, Sheffield.
334,440. **Flexible Pipe.** Dunlop Rubber Co., Ltd., London, and F. W. Warren, Manchester.
334,507. **Ball.** R. V. Laurence, London.
334,625. **Vacuum Flask.** Thermos (1925), Ltd., and L. T. Sawnor, both of London.
334,628. **Electrode.** I. G. Farbenindustrie A. G., Frankfort a. M., Germany.
334,675. **Stuffing Box Sleeve.** C. R. Little, Styvechale, Coventry.
334,735. **Egg Printing Device.** A. Hanna, Rathfriland, Co. Down, Ireland.
334,766. **Paper Machine.** Papeteries Navarre, Seine, France.
334,768. **Safety Glass Apparatus.** L. J. Kolb, assignee of A. G. Worrall, both of Philadelphia, Pa., U. S. A.
334,785. **Automobile Floor.** Mechanical Rubber Co., Cleveland, O., assignee of W. C. Keys, Detroit, Mich., and A. J. Brown, Lakewood, O., all in the U. S. A.
334,814. **Electric Cable.** Siemens-Schuckertwerke A. G., Berlin, Germany.
334,904. **Pyrophoric Igniter.** E. R. Beney, London.
334,913. **Fountain Pen.** E. Verga, Milan, Italy.
335,026. **Printing Machine Inking Device.** A. Whitworth, S. B. Chamberlain, and S. P. Jay, all of London.
335,141. **Electric Cable.** W. Brown, Glasgow, Scotland.
335,145. **Gas Receptacle.** A. Goldberg, Berlin, Germany.

Germany

511,832. **Sponge Pessary.** L. Pierchalla, Beuthen.
512,091. **Balloon Fabric.** Continental Gummiwerke A. G., Hannover.
512,763. **Block Belt.** W. Herminghausen, Eppstein, Taunus.
512,829. **Artificial Foot.** J. Loth, Koslin, Pomm.

Designs

1,141,429. **Hot Water Bottle Cover.** H. Schlosser, Berlin N. 24.
1,141,525. **Nipple.** J. Lammer, Stuttgart.
1,141,726. **Tire Cover.** W. Muller, Bad Freienwalde, a. d. O.
1,141,981. **Milk Can Cover.** Pahl'sche Gummi und Asbest Gesellschaft m. b. H., Dusseldorf-Rath.
1,141,986. **Sponge Corn Pad.** H. Smithausen, Dusseldorf.
1,142,051. **Tassels for Shades.** H. Kuch, Hannover.
1,142,074. **Elastic with Fastener.** M. Jungbecker, Worms am Rhein.
1,142,078. **Pavement Strips.** Franz Clouth Rheinische Gummiwarenfabrik A. G., Koln, Nippes.
1,142,203. **Soap Dishes.** Veritas Gummiwerke A. G., Berlin, Lichterfelde Ost.
1,142,580. **Skimmer and Runner.** P. Wendisch, Frankfurt a. M.
1,143,349. **Pocket Inhaler.** Sanitor Versand Zentrale, Wiesbaden.
1,143,408. **Atomizer.** E. Wolters, Hamburg 30.
1,143,500. **Bathing Cap.** A. G. Metzeler & Co., Munich.
1,143,579. **Reinforced Stocking.** F. Viertel, Zeulenroda, Thuringia.
1,143,611. **Rubber Cable Ends.** P. Jordan, Berlin-Steglitz.
1,143,765. **Bathing Slipper.** Continental Gummiwerke A. G., Hannover.
1,143,825. **Soft Rubber Packing.** O. Wiencke, Hannover.
1,144,047. **Pail.** Continental Gummiwerke A. G., Hannover.
1,144,075. **Sock.** W. Farber, Zeulenroda.
1,144,105. **Friction Blocks.** Continental Gummiwerke A. G., Hannover.
1,144,202. **Soap Saver.** Continental Gummiwerke A. G., Hannover.
1,144,223. **Inflatable Toy.** Gummiwaren-Fabrik bei Melle, Wortmann & C. Bosch, Melle, b. Hann.
1,144,224. **Inflatable Hollow Body.** Gummiwaren-Fabrik bei Melle, Wortmann & C. Bosch, Melle, b. Hann.
1,144,294. **Ice Preventer for Airplanes.** Continental Gummiwerke, A. G., Hannover.
1,144,657. **Knee Protector.** A. G. Metzeler & Co., Munich.
1,144,915. **Sponge Rubber and Leather Mattress.** J. Dietrich & Hannak, Chemnitz.
1,144,942. **Suspenders.** T. Vorck, Wuppertal-Barmen, and P. Zimmermann, Wuppertal-Oberbarmen.
1,145,173. **Harness Cushioning.** Rohwedder & Co., Hamburg 1.
1,145,299. **Window Cord.** Hansens Gummi-und Packungs Werke, Paul & John Hansen, Hannover-Wulfel.
1,145,311. **Shoe Brush.** Welt Wachs-Werk, Egbert Gunther Sohne, Dresden A. 19.
1,145,445. **Suction Piece.** Schwalenberg & Schumacher, Dusseldorf.
1,145,448. **Cable.** Hackethal Draht und Kabel-Werke, A. G., Hannover.
1,145,498. **Lock.** Continental Gummiwerke A. G., Hannover.
1,145,657. **Belt Disk.** Eisenhuttenwerk Thale A. G., Thale, Harz.
1,145,799. **Hair Curler.** B. Cahn, Frankfurt a. M.

Prints

United States

12,812. **"Ride the Air" on the Highways.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.
12,813. **Air Flight Principle Tires.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.
12,814. **Like Riding on Air.** Tires. Fisk Tire Co., Inc., Chicopee Falls, Mass.

Trade Marks

United States

276,379. Label containing the words: **"Child Life Shoes."** Footwear. Cedar Grove Shoe Mfg. Co., Cedar Grove, Wis.
276,383. **Vita-Mode.** Footwear. Adapto Shoe Co., Inc., New York, N. Y.
276,386. **Penco.** Footwear. J. C. Penney Co., Wilmington, Del.
276,389. **Thom McAn Grace-Foote.** Footwear. Melville Shoe Corp., New York, N. Y.
276,397. **Federal.** Tires, inner tubes, tire flaps, etc. Federal Rubber Co., Chicago, Ill.
276,424. Representation of a blue and gold flag. Rubber and rubber and fabric riffles, rings, mats, matting, etc. Goodyear Tire & Rubber Co., Akron, O.
276,437. Triangle containing the letter: **"R."** Knitted, woven, and textile fabrics made of rubber. J. Römpler, A. G., Zeulenroda, Germany.
276,501. Representation of a woman's hands holding up a shoe against an arch across which appears the word: **"Cantilever."** Footwear. Ground Gripper Shoe Co., Inc., New York, N. Y.
276,504. **Paul Junior.** Footwear. Nath'l Fisher & Co., New York, N. Y.
276,505. **H-M.** Footwear. Hoge Montgomery Co., Frankfort, Ky.
276,509. Representation of the bottom of a human foot containing the words: **"The Impression Shoe."** Footwear. Woodbury Shoe Mfg. Co., Derry, N. H.
276,510. **Armode.** Footwear. D. Armstrong & Co., Inc., Rochester, N. Y.
276,521. **Master-Dek.** Rubber coated fabric. Hooven Co., Inc., Washington, D. C.
276,530. **Sunruco.** Inkwell bases, finger pads, sponge cups, etc. Sun Rubber Co., Barberton, O.
276,534. **Duragrip.** Pads for attachment to shoe heels. Phillips' Patents, Ltd., London, England.
276,538. Seal consisting of two circles containing the monogram: **"HM."** Footwear. Hoge Montgomery Co., Frankfort, Ky.
276,557. **Axiom.** Tires. Samson Tire & Rubber Corp., Los Angeles, Calif.
276,578. **Guild Footwear.** Footwear. Footwear Guild, Inc., New York, N. Y.
276,579. **Guild.** Footwear. Footwear Guild, Inc., New York, N. Y.
276,601. **Mastermat.** Mats and matting. E. H. Clapp Rubber Co., Boston, Mass.
276,602. **Tuftex.** Mats and matting. E. H. Clapp Rubber Co., Boston, Mass.
276,605. Representation of a blue and gold flag. Printing gum. Goodyear Tire & Rubber Co., Akron, O.
276,661. Representation of a roll of belting and thereupon the words: **"Dick's Original Balata, Gutta Percha & Canvas Belting."** Belts. R. & J. Dick, Ltd., Greenhead, Glasgow, Scotland.
276,680. **Hy-Gloss.** Waterproof fabrics. J. C. Haartz Co., New Haven, Conn.
276,712. **Vulcanized Against Metal.** Dentures. Union Square Dental Laboratories, Inc., New York, N. Y.
276,732. **Gynex.** Syringes. Gynex Corp., New York, N. Y.
276,761. **"Slushers."** Children's waterproof play pants. M. F. Decker, Minneapolis, Minn.

276,781. Diamond containing the word: **"Norko"** between two horizontal lines. Tire vulcanizers, tube plates, etc. Norko Mfg. Co., Boston, Mass.

276,823. **Elastex.** Pigments. Binney & Smith Co., New York, N. Y.

276,873. **Pontex.** Textiles coated or impregnated with pyroxylin, rubber, etc. E. I. du Pont de Nemours & Co., Wilmington, Del.

276,876. **Chevron.** Hot water bottles and fountain syringes. McKesson & Robbins, Inc., Bridgeport, Conn.

276,921. **BesTyet.** Portable tire repair kits and inner tube patches. Republic Rubber Co., Youngstown, O.

276,932. **All Weather.** Storage batteries. Goodyear Tire & Rubber Co., Akron, O.

277,004. **The Phantom of the Arch.** Footwear. Woodbury Shoe Mfg. Co., Derry, N. H.

277,010. Diamond containing the word: **"Graceform."** Brassieres and girdles. Fairy Brassiere Co., Inc., New York, N. Y.

277,016. **La Reine.** Raincoats. United States Rubber Co., New York, N. Y.

277,032. **Princess Chic.** Dress shields. A. Stein & Co., Chicago, Ill.

277,049. **"Peppies."** Footwear. Merrimack Shoe Mfg. Co., Lowell, Mass.

277,053. Representation of a woman in a riding habit enclosed in a horseshoe shaped frame, and below, the words: **"Active Maid."** Footwear. Ideal Shoe Mfg. Co., Milwaukee, Wis.

277,054. Representation of a sunburst above which appear the words: **"Sun Bath."** Footwear. Shaft-Pierce Shoe Co., Faribault, Minn.

277,077. **Anchor.** Tires and tubes. Firestone Tire & Rubber Co., Akron, O.

277,080. Emblem consisting of representation of a human foot between the letters: **"A"** and **"K"** below which appear the words: **"Arch Keeper. Supreme in Style & Comfort."** Footwear. J. M. Connell Shoe Co., S. Braintree, Mass.

277,092. Double ellipse containing the words: **"R. N. Shoe Officially Endorsed."** Footwear. S. Shapiro, doing business as Braintree Shoe Co., S. Braintree, Mass.

277,115. Representation of an arch consisting of a human foot, and below, the words: **"Firm Arch."** Footwear. Melville Shoe Corp., New York, N. Y.

277,118. **Com-Foot-Able.** Footwear. G. F. Walsh, New York, N. Y.

277,121. **Playmor.** Wearing apparel including bathing caps, raincoats, etc. Playmor Golf, Inc., New York, N. Y.

277,122. Seal containing representation of an oak tree and thereupon, the words: **"O a K Fibre."** Footwear. Teeple Shoe Co., Waupun, Wis.

277,138. **Marlborough.** Wearing apparel including raincoats. Big Store Co., Cincinnati, O.

277,139. **Style Rite.** Footwear. Sears, Roebuck & Co., Chicago, Ill.

277,142. **Chesco X-Er-Size Arch.** Footwear. Chesapeake Shoe Mfg. Co., Baltimore, Md.

277,144. Rectangle containing representation of three airplanes, and above, the word: **"Pursuit."** Footwear. Teeple Shoe Co., Waupun, Wis.

277,177. Ellipse containing the words: **"Gro-Cord Non-Slip Bath Mat."** Mats. Lima Cord Sole & Heel Co., Lima, O.

277,211. Representation of a chewing gum wrapper of red, blue, green, and yellow, across which appears the word: **"Presto."** Chewing gum. American Chicle Co., Long Island City, N. Y.

277,229. **Pontop.** Rubberized fabrics. E. I. du Pont de Nemours & Co., Wilmington, Del.

277,270. Representation of a scale balancing a feather on the left side and artificial teeth on the right, and below, the words: **"Feather Weight."** Dental rubber. Reliance Dental Mfg. Co., Chicago, Ill.

277,277. Word: **"Ace"** to right of representation of a spade containing the letter: **"A."** Etching baskets, etching frames, and dipping baskets. American Hard Rubber Co., Hempstead, N. Y.

277,415. Fanciful red design containing the word: **"Better."** Inner tubes, tire repair accessories, transmission and brake linings, radiator hose, etc. Better Products Co., Inc., Dallas, Tex.

277,530. **Peau-Doux.** Golf balls. Walgreen Co., Chicago, Ill.

277,603. **Euflata.** Tennis balls and balls for games. J. W. Paton, Liverpool, England.

277,638. **Puncture Seal.** Inner tubes. Goodyear Tire & Rubber Co., Akron.

Dominion of Canada

50,614. **Footsure.** Bath mats. F. C. Brewer, Los Angeles, Calif., U. S. A.

50,635. **Juniata.** Horseshoe pads, horse and mule shoes, rubber hose, pedal pads, etc. Phoenix Mfg. Co., Joliet, Ill., U. S. A.

50,637. **Inca.** Office supplies. E. Hassinger, Barcelona, Spain.

50,647. **"Ventube."** Tubing. E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

50,648. Name: **"Du Pont"** fancifully displayed within an ellipse over the word: **"Ventube."** Tubing. E. I. du Pont de Nemours & Co., Wilmington, Del., U. S. A.

50,654. Representation of a blue and gold flag. Flooring and tiling, construction materials, lathe cut goods, molded goods, etc. Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont.

50,712. **Anchor.** Tires. Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont.

50,716. Triangular device, the longest distance between the two points being at the top; the words: **"Barry and Staines"** run horizontally across the center of the triangle, overlapping at both sides; in the space at the top, the words: **"Made in Canada,"** and the words: **"Trade Mark"** appearing on the two sides of the device. Rubber, gutta percha, caoutchouc, etc. Barry & Staines Linoleum (Canada), Ltd., Farnham, P. Q.

50,725. Word: **"Excelsior,"** written in a fanciful way and flanked by two circles showing within, the letter: **"E."** Vaginal douches, sponges, and combs. Continental Gummi-werke A. G., Hannover, Germany.

50,726. **Gloria.** Vulcanized and soft rubber goods. Continental Gummi-werke A. G., Hannover, Germany.

50,727. Word: **"Minerva,"** flanked by two devices showing the letter: "E" written in a fanciful manner, within a wavy border line. Combs and sponges. Continental Gummi-werke A. G., Hannover, Germany.

50,744. Rectangular label having a panel thereon formed by superimposing a rectangle and a circle; upon the rectangle appears the word: **"Kaufman,"** and in the circle above the rectangle, the word: **"Rubber"** and below, the word: **"Company."** Footwear. Kaufman Rubber Co., Ltd., Kitchener, Ont.

50,747. Representation of a shield having a broad vertical red line bisecting the shield, and a white horizontal line traversing the shield above a U-shaped figure disposed within the shield below the white line. Rubber solvent, mineral rubber, etc. Union Oil Co. of Canada, Ltd., Vancouver, B. C.

50,748. Representation of a shield having a broad vertical red line bisecting the same. Rubber solvent, mineral rubber, etc. Union Oil Co. of Canada, Ltd., Vancouver, B. C.

United Kingdom

515,601. **Taurus.** Goods manufactured from india rubber and gutta percha not included in other classes than Class 40, but excluding wire covered with india rubber or gutta percha. P. B. Cow & Co., Ltd., London, E. C. 2.

515,816. **Leader.** All goods included in Class 40. Leyland & Birmingham Rubber Co., Ltd., Leyland, Lancashire.

The Most Deadly Weapon

The modern automobile is a more deadly weapon than the pistol and should be placed in the hands only of persons of good moral character and demonstrated ability to drive.

This dictum, based on a study of crime and accident statistics both here and abroad, was pronounced recently by a well-known Chicago judge. He was talking in the interests of universal passage of drivers' license laws.

Assassins slay 9,000 persons a year in this country, but more than three times that many are laid low by automobiles. Where no license law prevails, the automobile may be placed in the hands of congenital idiots, habitual drunkards, and criminals.

If automobile accidents were eliminated we could do away with the services of one-third of our judges, he said. ***National Safety Council.***

Designs

United States

82,370. **Hot Water Bottle.** Term 7 years. T. W. Casey, Akron, assignor to Seiberling Latex Products Co., Barberton, both in O.

82,390. **Tire Casing.** Term 14 years. B. R. Prall, assignor to Montgomery Ward & Co., Inc., both of Chicago, Ill.

82,441. **Tire.** Term 7 years. J. J. McDonald, W. View, Pa.

82,468. **Tire Inflation Device.** Term 14 years. S. M. Weisberg, Brooklyn, N. Y.

82,475. **Rubber or Similar Material.** Term 14 years. J. D. Berwick, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

82,516. **Sole.** Term 7 years. L. M. Oakley, Trenton, N. J.

82,517. **Heel.** Term 7 years. L. M. Oakley, Trenton, N. J.

Exchange Contract Revised

ON December 15, 1930, members of the Rubber Exchange of New York adopted a number of important revisions in the A contract which had previously been dealt in with the No. 1 Standard contract.

A manufacturer who buys the revised A contract will receive delivery of 10 tons of rubber on each contract. Quotations will be in one .01 of a cent per pound, making it the same as the No. 1 Standard.

Delivery of the 10 tons or 22,400 pounds in the new A unit will be made up of any one of the five following grades: No. 1 ribbed smoked sheets; No. 1 thin crepe; No. 2 thin crepe, thick crepe, and ribbed smoked crepe: No. 3 ribbed smoked sheets; No. 4 ribbed smoked sheets; and No. 5 ribbed smoked sheets.

Trading in the new A contract will begin on January 5, 1931, for deliveries February 2 and thereafter, and will be dealt in along with the old A contract as well as the No. 1 standard terms. The old A form of trading, however, will be permitted to embrace only those months now listed, and the contract, which has been in force ever since the Exchange was opened in 1926, will be permitted to expire at the end of 1931.

The No. 1 Standard contract is quoted in one .01 of a cent, but only one kind of rubber is good delivery. Hevea plantation rubber which has been certificated by the Rubber Exchange is the only grade of rubber which is tenderable.

What are the reasons for these two contracts, for the small fractions of a cent in quotations, and for the allowance of the delivery of five grades of rubber on the A contract?

One .01 of a cent a pound seems to be an unnecessarily small division, but when the entire contract of 10 tons is taken into consideration, the difference is not so small. On 22,400 pounds of rubber, a fluctuation of one .01 of a cent means a change of $2.24 in the price of each contract, and when a number of contracts is bought or sold, as is usually the case, the fractional variation assumes respectable figures.

Permission to deliver five grades of rubber against the A contract also was given for a sound reason. Suppose there were only one grade of rubber deliverable. Buyers could make their purchases all right, but when delivery time came there might not be enough of the particular grade of rubber to go around. That would create a situation contrary to that for which the Exchange was organized—a means of equalizing supply and demand.

The A contract is used a great deal for hedging purposes. A manufacturer will buy this contract to fix the price of his raw material; but when time for delivery approaches, he will sell his contract and buy actual rubber of the grade he requires in the open market.

The No. 1 Standard contract permits the delivery of only one grade of rubber, and the quality of the rubber is certificated. The manufacturer who uses this grade, therefore, will buy his contract and accept delivery of the rubber.

Both contracts are necessary for the efficient operation of the Rubber Exchange.

How to Hedge

AT PRESENT the drastic effects of the drop in rubber prices are still evident, and many manufacturers are looking about for means to prevent the recurrence of such a calamity.

In a series of articles we shall try to explain how hedging protects the manufacturer against loss in the value of his raw material. We shall try to make our explanation as clear as possible.

Actually, there is nothing more to hedging than a purchase and a sale. It can be compared with a hedged bet, with which almost everyone is familiar. You bet on one side, and then you bet on the other side. No matter the outcome, you break even. Do the same thing when you buy crude rubber.

Hedging contract must employ the use of the Rubber Exchange; so we shall first explain briefly the necessary terms. Rubber is bought on the Exchange in "contracts." The No. 1 Standard contract calls for the delivery of ten tons of Hevea plantation rubber, which is guaranteed to be of a certain quality through inspection by a special committee. To buy one hundred tons of rubber you would purchase ten No. 1 Standard contracts. There is also an A contract allowing the delivery of five grades of rubber, but it is not necessary to explain that for our purposes.

The No. 1 Standard contract can be bought for delivery in any one of the twelve succeeding months. A contract in any month except the current one is called a "future" contract. If you bought rubber in January and wanted it delivered in February or March, you would buy a future contract in February or March for delivery in those months.

Suppose that it is your custom to buy 600 tons of rubber in January to cover your needs of 100 tons a month from January to July. Ordinarily you would go into the open market and buy 600 tons of rubber. If the price dropped before July; well that's your hard luck. With the hedging contract, on the other hand, a drop in the market would mean nothing.

The principle of hedging, you will remember, is to sell rubber every time you buy. All right. We'll buy 60 contracts of rubber (10 tons each) for immediate January delivery, at 10 cents. We'll also sell 60 future contracts in September, or any late month at 10 cents.

Beginning with January we use one hundred tons of rubber each month; so we must reduce our hedge sale of futures by that amount. Each month we buy 10 September contracts (100 tons) and cancel part of our hedge sale. We are able to make these purchases every month at 10 cents, the same price at which we sold them, until April. In April the market drops to 8 cents, and we make 2 cents a pound on the 100 tons we cover in that month. But a drop of 2 cents in raw rubber means that we must reduce the price of our finished product to meet competition; so what we gain on one side, we lose on the other. Let us tabulate the transactions for clearness.

In January: (1) Buy 60 contracts at 10 cents for immediate delivery. (600 tons); (2) Sell 60 September future contracts at 10 cents.

In April: (The price drops to 8 cents.) (A.) Reduce the price of the finished product to meet competition; (B.) Buy 10 September contracts at 8 cents. (100 tons.)

The only transactions ordinarily completed are "1" and "A," and they show a loss. The hedging transactions are in "2" and in "B", and show a profit which offsets the loss in "1" and "A".

Each month ten September contracts are bought back until the sale is all evened up, and no matter whether the market rises or falls, the profit or loss in the futures contracts offsets that in the actual rubber.

European Notes

(*Continued from page* 90)

rubber balloons also show a tendency to fall off.

According to information obtained by *India Rubber Journal*, the rubber industry in France has taken a turn for the worse. Most factories in the Clermont-Ferrand district are working five days a week, and others, including the Torrilhon concern, are working four days. Employes are being laid off, Michelin for instance having discharged about 20 per cent of the factory workers within the last months. Dunlop, whose French branch is said to be well occupied, is to establish a wheel factory at Le Bourget, near Paris.

The fusion of Manufacture de Joints Amiante et Caoutchouc and Etablissements Palladium is reported.

Etablissements Bognier et Burnet will increase its capital which now is 4,200,000 francs to 8,200,000 francs by issuing 40,000 new shares of 100 francs each.

Italy. A press report from Milan, states that the following three Italian rubber concerns have amalgamated: Walter Martiny, Soc. Piedmontese Industria Goma Affini, and Soc. Anon. Bergougnan Italiana.

It seems that the Italian rubber industry experienced a further setback during October, 1930, in consequence of which unemployment increased and part time operations mounted to 10.9 per cent from 8.3 per cent. But while certain factories have had to adopt part-time schedules, others report that orders for some lines have been so plentiful that the departments have had to work overtime in order to fill them. In the first eight months of 1930, imports of crude rubber fell to 97,751 quintals as compared with 110,224 quintals in the corresponding period of the previous year.

The value of goods imported showed a decline from 154,000,000 lire to 120,000,000 lire, but this was chiefly due to lower prices, and not to decreased quantities, for hard rubber sheets, automobile tires and tubes and rubberized fabrics and articles thereof were imported in greater quantities than in the year before. On the other hand, exports of tires and tubes and rubber gloves show considerable reductions. Thus automobile tire shipments abroad were only 46,552 quintals instead of 65,149 quintals, while rubber gloves receded from 1506 to 511 kilos.

MARKET REVIEWS

Crude Rubber

New York Exchange

THE November consumption figures began a wave of selling that sent rubber to levels below 8½ cents. October had shown the unexpectedly fine total consumption figure of 27,271 tons, and estimates for November were pushed up to 25,000 tons at least. The figure, however, was only 23,479 tons; and traders showed their disappointment, disclosed in turn by market prices.

Another reversal of favorable October figures came in the production figures on both large and small estates in the East. Estates below 100 acres and those with more than 100 acres showed a slight increase in production over October. But it must be remembered that November and December are the best tapping months, and the steady prices might have induced increased activity. Reports, however, are daily being received that large estates are contemplating sizable reductions in acreage for 1931.

Another favorable prediction is that tire manufacturers will come to life with the new year. In fact, estimates for January consumption by manufacturers is already put at 31,000 tons.

Tire inventories are getting lower at automobile plants and factories; while the Department of Commerce estimates that 1930 replacement demand will not exceed 40,000,000 casings, an average of only 1.66 tires per car, a decline of 21.3 per cent from 1929. These figures seem to justify the predictions of tire manufacturers for 1931.

Automobile manufacturers are showing more than the customary activity at this season of the year, except that Ford's shutdown for inventory will lower the index; but their position is strong. Cars in dealers' hands are at a low average; thus any new buying must be reflected in factory activity and a demand for more raw material.

More encouraging production and consumption figures are expected for the new year, and all is in preparation for their first appearance.

Week ended November 29. The tone of the market reflected the intrusion of a holiday, and quietness prevailed although the undertone was steady. For the week, prices were almost unchanged on an average, with the earlier months showing losses of about five points, and the later months gains of 5 to 10 points.

The liquidation in old December was absorbed from various sources with little hesitancy. Notices of liberal c. i. f. offerings from the Far East at lower prices depressed the market in the beginning of the week, but on Wednesday these advices were counteracted apparently by reports that five of the large French rubber estates in Popancei, West Sumatra, are closing down for two years; this closing was interpreted to mean an annual reduction of more than 3,960,000 pounds in rubber exports from the Dutch East Indies.

Shipments from the Dutch East Indies of crude rubber for October totaled 19,533 tons, against 20,240 tons shipped in September, according to cables to the Rubber Exchange of New York on Wednesday. East Coast Sumatra was the largest shipper in October with a total of 7,068 tons, against 6,765 tons in September. Java and Modoera ranked second with 6,011 tons last month, as compared with 6,056 tons for September.

Other advices to the members of the New York Rubber Exchange stated that the inventory position of the large tire manufacturers has been brought down to a basis allowing resumption of full operations during the first week in January.

There is actually a shortage in stocks of some sizes of tires; and Goodrich, Akron, has increased its working forces this week following receipt of a large order from a national tire distributing system. Production by the U. S., Detroit, is being

RUBBER BULL POINTS

1. Replacement sales of tires in 1930 will be the lowest in automobile history, according to the Department of Commerce.
2. Shipments from Ceylon during November totaled 6,276 tons, as compared with 7,605 tons in October; shipments from Ceylon to the United States and to the United Kingdom also were lower.
3. Unsold cars in automobile dealers' hands are at a very low average.
4. Stocks of finished tires on hand at plants of automobile manufacturers were reduced along with inventories at tire factories.
5. Shipments of Malayan crude rubber during November totaled 41,281 tons, a decline of 6,489 tons from the shipments of the previous month. Shipments to the United States in November were 22,276 tons, against 24,999 tons in October.
6. Numbers of estates are announcing cuts in production schedules for 1931.
7. Conferences by Dutch growers reopened at Amsterdam.
8. Tire inventories are low enough to justify wide scale operations after the first of the year.
9. Estimates place the crude rubber requirements of manufacturers during January at approximately 31,000 tons.
10. The Ohio Standard Oil joins the New Jersey and the Indiana companies in the sale of tires and tubes at service stations.

RUBBER BEAR POINTS

1. For the first eleven months of 1930 consumption was 355,730 long tons, compared with 445,585 tons during the same period in 1929 and with 410,105 tons during the corresponding period of 1928.
2. The amount of crude rubber on hand and in transit overland at the end of November amounted to 189,295 long tons, a new high record, as compared with 184,701 tons at the end of October and with 92,219 tons at the close of November, 1929.
3. Automobile production in the United States and Canada in November was 146,185 cars and trucks, compared with 154,585 in October and with 266,997 in November, 1929.
4. Production on estates of 100 acres or larger in the Far East during November was 21,673 tons, against 21,475 tons during October.
5. Output on estates of under 100 acres was 14,914 tons, against 14,845 tons in October.
6. Consumption for November was 23,479 tons, against 27,271 tons in October, and 27,659 tons in November of last year.
7. Dealers' stocks at the end of November at Singapore, Penang, etc., totaled 36,884 tons, dry content, which compares with 34,479 tons, dry, at the end of October.

Rubber Exchange

Daily Futures—Smoked Sheets—Clearing House Prices—Cents Per Pound—"No. 1 Standard" Contracts

Positions	November, 1930						December, 1930								
1930	24	25	26	27*	28	29	1	2	3	4	5	6	8	9	10
Nov.	9.20	9.05	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec.	9.20	9.05	9.06	...	9.00	9.10	9.45	9.50	9.43	9.25	9.33	9.40	9.60	9.50	9.45
1931															
Jan.	9.35	9.18	9.18	...	9.12	9.22	9.56	9.63	9.53	9.36	9.42	9.45	9.66	9.53	9.50
Feb.	9.45	9.30	9.29	...	9.23	9.33	9.67	9.75	9.67	9.47	9.51	9.56	9.77	9.62	9.60
Mar.	9.58	9.42	9.40	...	9.35	9.45	9.78	9.87	9.82	9.58	9.60	9.68	9.88	9.71	9.70
Apr.	9.69	9.51	9.53	...	9.45	9.55	9.88	9.97	9.93	9.67	9.68	9.79	9.99	9.81	9.80
May	9.80	9.60	9.66	...	9.55	9.65	9.98	10.07	10.02	9.75	9.75	9.90	10.10	9.90	9.90
June	9.88	9.70	9.76	...	9.65	9.75	10.09	10.16	10.11	9.85	9.85	10.00	10.17	10.00	9.98
July	9.95	9.80	9.82	...	9.75	9.85	10.20	10.25	10.18	9.95	9.95	10.10	10.26	10.10	10.05
Aug.	10.08	9.90	9.96	...	9.90	9.98	10.32	10.34	10.29	10.06	10.00	10.20	10.36	10.18	10.15
Sept.	10.20	10.00	10.06	...	10.00	10.10	10.43	10.43	10.40	10.17	10.15	10.30	10.46	10.30	10.25
Oct.	10.37	10.20	10.26	...	10.20	10.30	10.65	10.66	10.56	10.27	10.25	10.35	10.55	10.40	10.35
Nov.	...	...	...	...	...	...	10.80	10.76	10.72	10.47	10.40	10.50	10.65	10.50	10.45

Positions	December, 1930														
1930	11	12	13	15	16	17	18	19	20	22	23	24	25*	26	27
Nov.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dec.	9.55	9.48	9.33	8.95	8.85	8.75	8.85	8.60	8.50	8.35	8.55	8.55	...	8.55	8.50
1931															
Jan.	9.55	9.48	9.30	8.95	8.85	8.75	8.90	8.65	8.55	8.35	8.55	8.55	...	8.56	8.55
Feb.	9.64	9.53	9.40	9.05	8.85	8.83	9.02	8.73	8.60	8.47	8.61	8.63	...	8.64	8.60
Mar.	9.73	9.57	9.50	9.15	8.95	8.92	9.15	8.80	8.75	8.59	8.67	8.72	...	8.72	8.65
Apr.	9.83	9.66	9.60	9.25	9.04	9.02	9.22	8.88	8.85	8.70	8.76	8.81	...	8.79	8.75
May	9.93	9.75	9.70	9.35	9.12	9.12	9.29	8.95	8.95	8.80	8.85	8.90	...	8.86	8.85
June	10.03	9.85	9.75	9.44	9.18	9.20	9.39	9.07	9.00	8.88	8.92	8.98	...	8.95	8.94
July	10.12	9.95	9.80	9.53	9.25	9.28	9.50	9.20	9.10	8.95	9.00	9.05	...	9.05	9.02
Aug.	10.22	10.05	9.90	9.63	9.35	9.37	9.55	9.28	9.23	9.05	9.09	9.14	...	9.15	9.13
Sept.	10.32	10.15	10.00	9.73	9.45	9.45	9.60	9.35	9.35	9.15	9.18	9.23	...	9.25	9.25
Oct.	10.42	10.25	10.20	9.83	9.55	9.55	9.70	9.45	9.45	9.25	9.28	9.45	...	9.35	9.35
Nov.	10.52	10.35	10.30	9.93	9.65	9.65	9.80	9.55	9.55	9.35	9.38	9.55	...	9.45	9.45

* Holiday.

gradually increased, and the daily output is now around 25,000 tires as compared with 15,000 during the summer months.

Firestone, Akron, is maintaining production at an unchanged pace, while Goodyear, Akron, now operating at a reduced daily rate, plans to resume operations at full capacity after the first of the year to meet spring delivery demands.

The Department of Commerce figures on October output of motor vehicles in the United States and Canada reveal 154,585 cars and trucks produced, compared with 224,835 in September, and 394,540 in October a year ago.

Prices on No. 1 Standard contract on November 29 were:

	High	Low	Close	Previous Close
Dec.	...	...	9.10	9.00
Jan.	...	...	9.22	9.12
Feb.	...	...	9.33	9.23
Mar.	9.45	9.40	9.45	9.35/40
Apr.	...	...	9.55	9.45
May	...	...	9.65/70	9.55/60
June	...	...	9.75	9.65
July	9.80	9.80	9.85/88	9.75
Aug.	...	...	9.98	9.90
Sept.	10.19	10.10	10.10	10.00
Oct.	...	...	10.30	10.20
Spot	...	...	9.06	9.06

Week ended December 6. The market drifted down the tide almost imperceptibly in the course of the week, and the few points lost each day accounted for an average of 20 to 30 points for the six days of trading.

The only outstanding trading feature was the strong demand for the new September contracts. Commission houses operated on both sides of the new delivery, and this activity was credited to accumulation for speculative account.

The November figures for shipments from the Far East had already been discounted in this market, and the bullish news was offset on Monday by reports of increased cost and freight offerings at lower prices.

Shipments of Malayan crude rubber during November totaled 41,281 tons, a decline of 6,489 tons from the shipments of the previous month. Shipments to the United States from Malaya last month were 22,276 tons, against 24,999 tons in October. Arrivals of rubber at New York during November were 29,485 tons, and the total for the entire country is estimated at 34,500 tons.

Automobile production in the United States and Canada in November was 146,185 cars and trucks, compared with 154,585 in October and 226,997 in November, 1929, according to the National Automobile Chamber of Commerce. Including November the production in the first eleven months of this year was put at approximately 3,361,217 units, compared with 5,496,213 last year.

While these figures are not encouraging as they stand, if the seasonal trend is taken into account, they present a different picture. *The New York Times'* weekly index is so adjusted, and the index figure for the week ended November 29 stood at 109.3, as against 87.7 for the week ended November 22, and 92.7 for the week ended November 30, 1929.

Quoting from the *Times'* analysis we read the following: "The correct interpretation of this vigorous upswing in the automobile index appears to be expressed most aptly in a description of the automobile situation by a leading service, which says: 'As far as the automobile industry is concerned, 1931 is already here. The attitude of the manufacturers in attempting to anticipate public demand by putting their new merchandise on the market before the actual close of the year results in an ushering in of the new automotive season irrespective of the calendar.'"

RUBBER EXCHANGE ACTIVITIES

Week Ended	Transactions: Contracts Sold: Number	Transactions: Contracts Sold: Tons	Transferable Notices	Week-End Tone
Nov. 29	670	1,675.0	20	Steady
Dec. 6	760	1,900.0	194	Steady
Dec. 13	690	1,725.0	72	Steady
Dec. 20	1,142	2,855.0	378	Steady
Dec. 27	715	1,787.5	307	Steady
Totals	3,977	9,942.5	971*	

*Deliveries of actual rubber.

Prices on No. 1 Standard contract at the close of December 6 were:

	High	Low	Close	Previous Close
Dec.	...	...	9.40	9.33
Jan.	...	...	9.45	9.42
Feb.	...	...	9.56	9.51
Mar.	9.70	9.70	9.68/70	9.60
Apr.	...	...	9.79	9.68
May	9.85	9.85	9.90	9.75/82
June	...	...	10.00	9.85
July	10.00	10.08	10.10	9.95/10.00
Aug.	...	...	10.20	10.05
Sept.	10.30	10.25	10.30	10.15/20
Oct.	...	...	10.35	10.25
Nov.	...	...	10.50	10.40
Spot	...	...	9.35	9.31

Week ended December 13. Paying little attention to the weakness in other commodity markets and the stock market, crude rubber exchange prices continued on the even tenor of their way. It was only on Saturday that the decline in the stock market drew a sympathetic drop in prices of rubber, and then only for a few points.

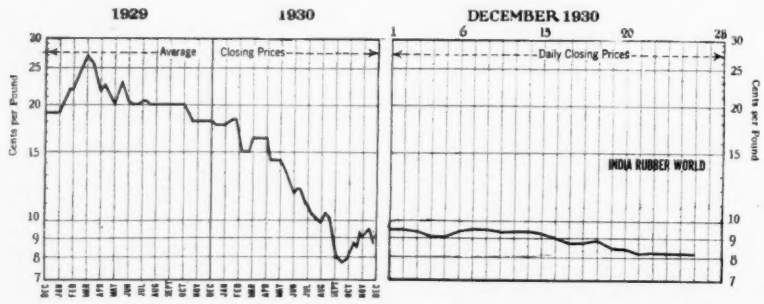
London and Singapore reported dull markets also, with very small changes. An unofficial estimate put the London stocks 800 tons higher, with those in Liverpool unchanged.

Dealers' stocks of crude rubber held in the Far East last month showed an increase of 2,462 tons over the previous month; stocks on hand November 30 totaled 37,658 tons, as compared with 35,196 tons in October and 37,185 tons in September. Harbor stocks at Singapore and Penang totaled 4,016 tons, a decrease of 718 tons from the previous month.

Imports of crude rubber into Great Britain during November amounted to 313,563 centals, as compared with 379,468 centals in October, according to the British Board of Trade rubber report cabled to the Rubber Exchange of New York. Exports from Great Britain in last month were 319,156 centals, against 175,742 centals in the previous month. Of this total, 1,008 centals were shipped to the United States, as compared with 816 centals similarly shipped in October.

Prices on No. 1 Standard contract at the close of December 13 were:

	High	Low	Close	Previous Close
Dec.	...	...	9.33	9.48
Jan.	...	...	9.30/35	9.48
Feb.	...	...	9.40	9.53
Mar.	9.50	9.50	9.50	9.57
Apr.	...	...	9.60	9.66
May	9.72	9.70	9.70/75	9.75/85
June	...	...	9.75	9.85
July	9.82	9.82	9.80/86	9.95
Aug.	...	...	9.90	10.05
Sept.	...	...	10.00/10	10.15
Oct.	...	...	10.20	10.25
Nov.	...	...	10.30	10.35
Spot	...	...	9.30	9.37



New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets

New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

	November, 1930: 24	25	26	27*	28	29	December, 1930: 1	2	3	4	5	6	8	9	10	11	12	13	15	16	17	18	19	20
Ribbed Smoked Sheet	9¼	9⅛	9⅛	...	9	9⅛	9⅛	9⅛	9⅜	9⅛	9⅛	9⅜	9⅝	9⅛	9⅜	9⅜	9⅜	9¼	9	8¾	8¾	8⅞	8½	8½
No. 1 Thin Latex Crepe	9⅝	9½	9½	...	9⅜	9½	9¾	9¾	9¾	9½	9½	9⅝	9⅞	9¾	9⅝	9¾	9¾	9⅝	9⅜	9	9⅛	9¼	8¾	8⅞
No. 1 Thick Latex Crepe	9¼	9⅛	9⅛	...	9⅛	9⅛	9½	9½	9⅜	9¼	9¼	9⅜	9⅝	9½	9⅜	9½	9½	9¾	9	8¾	8¾	9	8½	8½
No. 1 Brown Crepe	8⅛	8¾	8¾	...	8⅝	8⅝	8⅞	9	8⅞	8¾	8¾	8¾	9	9	8¾	8⅞	8⅞	8⅞	8⅝	8½	8½	8½	8⅛	8⅛
No. 2 Brown Crepe	8½	8½	8½	...	8⅜	8⅜	8⅝	8¾	8⅝	8½	8½	8½	8¾	8¾	8½	8⅝	8⅝	8¾	8¼	8¼	8¼	8⅛	7⅞	7⅞
No. 2 Amber	8¼	8¾	8¾	...	8⅝	8⅝	8⅞	9	8⅞	8¾	8¾	8¾	9	9	8¾	8⅞	9	8⅞	8⅝	8½	8½	8½	8⅛	8⅛
No. 3 Amber	8⅝	8½	8½	...	8½	8½	8⅝	8⅞	8¾	8½	8½	8⅝	8¾	8¾	8⅝	8⅝	8¾	8⅝	8⅜	8¼	8¼	8¼	7⅞	8
No. 4 Amber	8½	8⅛	8⅛	...	8⅛	8⅛	8¼	8⅜	8⅜	8¼	8¼	8¼	8⅜	8⅜	8¼	8¼	8⅜	8¼	8	8	7⅞	7⅞	7½	7½
Rolled Brown	8⅛	8⅛	8⅛	...	8⅛	8⅛	8⅛	8¼	8⅛	8⅛	8⅛	8⅛	8¼	8¼	8⅛	8⅛	8¼	8	7¾	7¾	7⅞	7⅞	7½	7½

*Holiday.

Week ended December 20. The November consumption figures published on Monday induced a sharp drop in rubber. Although short covering and reports of a meeting at Amsterdam served to bolster the market for a time, prices for the week showed a sizable decline.

Consumption of 23,479 tons for November was the smallest in any month since July, 1924, when only 23,396 tons were consumed. Stocks on hand and afloat at the close of November attained the record high total of 242,463 tons, compared with 235,823 tons at the close of October, and with 154,577 tons at the end of November last year.

The November census report from Malaya disclosed gains in estate outputs and dealers' stocks over the October figures, sending prices to lower levels and leaving them weak in tone.

Declared production on estates 100 acres or larger during the month was 21,673 tons, against 21,475 tons during October. The output of estates under 100 acres was 14,914 tons, against 14,845 tons, and dealers' stocks, 17,974 tons, against 15,350 tons for the previous month.

No information was available after the reported meeting of the Dutch growers at Amsterdam, but a relayed message from Sumatra reported that the important producing interest, Societe Financiere, would cut production on its estates by 20 per cent during 1931.

Shipments of crude rubber from Ceylon during November totaled 6,275 tons, as compared with 7,605 tons in October. Shipments from Ceylon to the United States last month were 3,730 tons, as compared with 4,759 tons in the previous month, while 1,297 tons went to the United Kingdom during November, as compared with 1,513 tons in the preceding month.

Stocks of finished tires on hand at plants of automobile manufacturers at the end of November were reduced along with inventories of the tire factories. An interesting report by the Rubber Division of the Department of Commerce showed that the average renewal sales per car of automobile tires during 1930 will be the lowest in history.

The average renewal sales per car were given as follows: 6½ to 7 casings were used yearly per car from 1910 to 1917; the rate declined from 1918 to 1921, reaching low for the last year of 3.16 casings per car; the rates for the following years were 2.93, 2.99, 2.38, 2.38, 2.48, 2.39, until a decline of 15.6 per cent from 1928 sent the figure to 2.11 in 1929, while in 1930 the figure will be about 1.66. Since it is frequently said that tire renewal sales are usually excellent in years of low automobile production, the situation may turn out favorably.

Prices on No. 1 Standard contract at the close of December 20 were:

	High	Low	Close	Previous Close
Dec.	...	...	8.50	8.60
Jan.	...	...	8.55	8.65
Feb.	...	...	8.60	8.73
Mar.	8.75	8.68	8.75	8.80/87
Apr.	...	...	8.85	8.88
May	8.95	8.95	8.95	8.95/9.00
June	...	...	9.00	9.07
July	9.10	8.98	9.10	9.20
Aug.	...	...	9.23	9.28
Sept.	9.25	9.25	9.35	9.35
Oct.	9.40	9.40	9.45	9.45
Nov	...	...	9.55	9.55
Spot	...	...	8.43	8.65

December 22. The easier trend at primary centers influenced rubber, and prices on the No. 1 Standard contract dropped from 12 to 20 points. Operations

New York Quotations

Following are New York outside market rubber quotations for one year ago, one month ago, and Dec. 26, the current date

Plantation Hevea	December 26, 1929	November 24, 1930	December 26, 1930
Rubber latex (Hevea)	$1.25 @	$0.75 @	$0.75 @
Sheet			
Ribbed, smoked, spot	.15½@.15¾	.09¼@.09⅜	.08⅜@.08⅝
December	.15½@.15¾	.09⅜@.09½	.08⅜@.08⅝
January-March	.15¾@.15⅞	.09½@.09¾	.08½@.08⅞
April-June	.16½@.16⅝	.09¾@.10⅛	.08⅞@.09¼
CREPE			
No. 1 Thin latex (first latex) spot	.16½@.16¾	.09¾@.10	.08¾@.09
December	.16½@.16¾	.09⅞@.10	.08¾@.09
January-March	.16¾@.16⅞	.10¼@.10⅜	.09 @.09¼
April-June	.17½@.17¾	.10½@.10¾	.09⅜@.09½
No. 2 Amber, spot ("B" blanket)	.13½@.14	.08⅞@.09	.07⅞@
December	.13½@.14	.08⅞@	.07⅞@
January-March	.13¾@.14	@	.08 @.08¼
April-June	.14½@.14¾	@	.08¼@.08½
No. 3 Amber, spot ("C" blanket)	.13½@.13¾	.08½@.08¾	.07⅜@.07¼
No. 1 Brown, clean, light, thin	.13¾@	.08¾@	.07⅞@
No. 2 Brown, clean, thin	.13¼@.13½	.08½@.08¾	.07⅜@
Brown, roll	.09½@.10	.08¼@.08½	.07½@
East Indian			
PONTIANAK			
Banjermasin	.08½@	.06 @	.06 @
Pressed block	.14¾@	.12 @	.12 @
Sarawak	.08½@	.06 @	.06 @
South American			
PARAS			
Upriver, fine	.16¼@	.12¾@	.11½@
Upriver, fine	*.23¼@	*.15½@	*.14½@
Upriver, coarse	.08 @	.08¼@	.07¾@
Upriver, coarse	*.14½@	*.10½@	*.10 @

South American	December 26, 1929	November 24, 1930	December 26, 1930
PARAS—*Continued*			
Islands, fine	$0.15¼@	$0.12 @	$0.10¾@
Islands, fine	*.22¾@	*.15 @	*.14¼@
Acre, Bolivian, fine	.16½@	.13 @	.11¾@
Acre, Bolivian, fine	*.23½@	*.16 @	*.14¾@
Beni, Bolivian	.16¾@	.13½@	.12 @
Madeira, fine	.16¼@	.12¾@	.11½@
CAUCHO			
Upper caucho ball	.08¼@	.07¾@	.07 @
Upper caucho ball	*.14¼@	*.10½@	*.10 @
Lower caucho ball	.07½@	.07 @	.06½@
Manicobas			
Ceará negro heads	†.19 @	@	@
Ceará scrap	†.11 @	@	@
Manicoba, 30% guaranteed	†.21 @	@	@
Mangabiera, thin sheet	†.21 @	@	@
Guayule			
Duro, washed and dried	.17 @	.15 @	.15 @
Ampar	.18 @	.16 @	.16 @
Gutta Percha			
Gutta Siak	.14½@.15½	.13¼@	.13½@
Gutta Soh	.20 @.22	.29 @	.29 @
Red Macassar	2.30 @2.50	@	@
Balata			
Block, Ciudad Bolivar	†.41 @	.32 @	.32 @
Colombia	†.39 @	.32 @	.32 @
Manaos block	.45 @	.37 @	.37 @
Surinam sheet	†.52 @	.57 @	.57 @
Amber	†.54½@	.60 @	.60 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal.

New York Outside Market (Continued)

	December, 1930					
	22	23	24	25*	26	27
Ribbed Smoked Sheet	8¼	8⅜	8⅜	...	8½	8⅝
No. 1 Thin Latex Crepe	8⅝	8¾	8¾	...	8⅞	8¾
No. 1 Thick Latex Crepe	8⅜	8½	8½	...	8½	8½
No. 1 Brown Crepe	8	7⅞	8	...	8	7⅞
No. 2 Brown Crepe	7¾	7⅝	7¾	...	7¾	7⅝
No. 2 Amber	8	7⅞	8	...	8	7⅞
No. 3 Amber	7¾	7⅝	7¾	...	7¾	7⅝
No. 4 Amber	7½	7⅜	7⅜	...	7⅜	7¼
Rolled Brown	7½	7⅜	7⅜	...	7½	7¼

*Holiday

Low and High New York Spot Prices

	December					
	1930*		1929		1928	
PLANTATIONS						
Thin latex crepe	$0.08¼@	$0.09⅝	$0.16¼@	$0.17⅜	$0.17½@	$0.19
Smoked sheet, ribbed	.08¼@	.09⅝	.15½@	.16½	.17⅝@	.18⅜
PARAS						
Upriver fine	.12 @	.12¼	.15¾@	.16½	.19¼@	.19¾
Upriver coarse	.07 @	.07½	.08¼@	.08¾	.13 @	.14
Upper caucho ball	.07 @	.07½	.08 @	.08¾	.12 @	.13

* Figured to December 27, 1930.

were in small volume and to some extent were devoted to switching activities. The next day a rally developed that sent prices from 5 to 20 points higher. Old December ran up from 8.10 to 8.50 and closed at that figure. On December 24. Activity fell to a low ebb before the holiday, and almost no developments were evident.

The day after Christmas, December 26, rubber declined to 8.7 cents. There was no interest on the part of consumers and not much activity because of the fact that the foreign rubber markets were closed from Christmas till the following Monday.

Prices on No. 1 Standard contract at the close of December 27 were:

	High	Low	Close	Previous Close
Dec.	...	...	8.50	8.55
Jan.	8.49	8.42	8.55	8.56
Feb.	...	...	8.60	8.64
Mar.	8.67	8.67	8.65-8.67	8.72-8.80
Apr.	...	...	8.75	8.79
May	...	...	8.85	8.86
June	...	...	8.94	8.95
July	9.02	9.02	9.02	9.05-9.10
Aug.	...	...	9.13	9.15
Sept.	9.25	9.25	9.25	9.25
Oct.	9.40	9.35	9.35	9.35
Nov.	...	...	9.45	9.45
Spot	...	...	8.43	8.48

N. Y. Outside Market

Although prices have dropped substantially in the last month, buyers are somewhat aloof. Offers have been made listlessly, but they have been at fractions below the asked prices. Ribs and ambers have absorbed all the interest evidenced.

Rubber prices ignored the weakness in other commodities and in the stock market for some time. But when poor consumption figures for November were announced, crude rubber yielded, and prices slid toward 8 cents.

The lack of activity is probably due partly to the holiday season, and partly to a waiting attitude for the purpose of seeing what the new year will bring. The year-end statistics will soon appear, after they are absorbed, traders may take a definite position.

At present the favorable indications are found to lie in the low tire inventories and the low replacement demand in 1930. It has also been said that automobile production is one of the first to recover after a depression; so replacement demand for tires may be augmented by original equipment demand.

The low prices give promise of curtailed production in the Far East though the November figures showed an increase. After December it is expected that production will steadily decline. All eyes are turned to 1931, and great things are expected of it.

Week ended November 29. The lack of factory interest is still an unpleasant feature of the market, although prices have been fairly steady in face of the light demand.

Automobile output declined in October to a figure below that of September and far below that of the previous year. Automobile executives are hopeful that production in 1931 will be at least as large as in 1930, and a sharp upturn in demand should appear soon if these predictions are to be fulfilled. The industry's hopes are based on the belief that automobiles have become a necessity in this country and that the normal replacement demand will cause an upturn in this field before general business conditions show much improvement.

One of the few favorable pieces of news emanating from London for the week was the estimate of a decline of about 750 tons in the stocks of crude rubber held at London and Liverpool. On Friday smoked sheet spot sold at 4-9/16d. a pound sellers in London, December from 4-9/16d. to 4½d. buyers, January-March at 4-11/16d. to 4-5/8d. buyers, April-June at 4-13/16d. to 4-3/4d. buyers, July-September at 5d. to 4-15/16d. buyers, October-December at 5-1/8 to 5-1/16d. buyers, crepe spot at 4½d. to 4-1/16d. sellers. Para grades were unchanged. Hard fine spot was quoted at 6-¼d. sellers.

Prices at the close of November 29 were:

Spot	Nov. 29	Month Ago	Year Ago
Crepe	9½	9⅜	17⅛
Ribs	9⅛	9	16¼
Upriver fine	12½	12¼	16½

Week ended December 6. One large manufacturer is reported to have bought large quantities of rubber in the market whenever it showed a tendency to sell off, and this report gave rise to the opinion that it was merely support buying and not for stock.

The statistical figures on shipments from Malaya for November were lower in accordance with expectations, but consumption has not shown any corresponding increase. Stocks in London and Liverpool continue to increase, with an addition of 500 tons expected again for the present week.

Automobile output for November was lower than last year or the previous month, and for the first eleven months of 1930 output was 39 per cent less than in the same period of 1929. Tire factory schedules have not yet increased, and manufacturers are patiently awaiting the replacement demand that must eventually begin during next season.

Reports continue to be received of decreased and ceased tapping operations on rubber plantations in the Far East, and in time this trend may result in an improved statistical position upon which the market can be rebuilt.

Prices at the close of December 6 were:

Spot	Dec. 6	Month Ago	Year Ago
Crepe	9⅝	9	17
Ribs	9⅜	8⅝	16⅛
Upriver fine	12¾	12¼	16¼

Week ended December 13. A moderate jobbing demand developed during the week; otherwise there were only a few minor changes.

According to information received from Ceylon, it is understood that estates are stopping the tapping of low-yielding acreage, but owing to overhead charges this practice cannot be carried far without increasing loss.

About 40 per cent of the rubber properties in and around Singapore are said to be unable to produce rubber at a profit with the present level of prices. It is indicated that after the two best tapping months, November and December, many of the estates will find it necessary to cease producing.

Together with this news from the Far East comes an announcement which reveals that resumption of activity in the tire manufacturing industry is slated to get under way on a fairly large scale next month. This information is based upon their requirements of crude rubber during January.

Estimates place the crude rubber requirements of manufacturers during January at approximately 31,000 long tons, as compared with about 25,000 tons for the month of December. Inventories are now low enough to justify wide-scale operations at factories after the turn of the year, Akron advices to the local trade stated.

Prices at the close on December 13 were:

Spot	Dec. 13	Month Ago	Year Ago
Crepe	9⅝	9¼	17⅛
Ribs	9¼	8¾	16¼
Upriver fine	12¼	12½	16

Week ended December 20. Manufacturers and dealers were aloof in the first part of the week. When factory inquiry did develop bids were slightly under sellers' ideas on the December and near months, but the spread between them on distant positions was too wide. On Friday the actuals were down ¼-cent per pound to a December asking basis of 8¾ cents for ribs. The ambers and browns followed, and factory interest at the lower basis was restricted and indifferent.

Statistics from Malaya were bearish with production on large and small estates showing an increase. Although the gain was small, it loomed large because the expectation was for another decrease in production.

Automobile production has reached a low point for the year, but it reversed a seasonal trend in that it dropped off much less than it usually does during November. A year ago November production fell off 167,543 units as compared to October. This year the decline amounts to about 8,400, according to the estimate of the National Automobile Chamber of Commerce.

The automobile show season is in the offing, and greater activity is reported from manufacturers except where shops are closed for inventory. More men are being taken on, but they are principally former employes.

Prices at the close on December 20 were:

Spot	Dec. 20	Month Ago	Year Ago
Crepe	8⅞	9⅝	16¾
Ribs	8½	9¾	15⅞
Upriver fine	12	12½	16

During Christmas week there was very little activity, but prices were well sustained. On December 26 the price of ribs declined to 8¾ cents with business very quiet owing to lack of interest on the part of consumers.

Prices at the close on December 27 were:

Spot	Dec. 27	Month Ago	Year Ago
Crepe	8¾	9½	16⅝
Ribs	8⅜	9⅛	15¾
Upriver fine	12	12½	16

November Consumption

United States crude rubber statistics in long tons released by The Rubber Manufacturers Association for November, are as follows: Consumption, 23,479; Imports, 31,765; On hand in transit overland, 189,925; Afloat for United States ports, 52,538.

Rubber Scrap

THE activity of the rubber scrap market in December was essentially the same as in November. In other words the consuming demand was seasonal and rather light. Rubber scrap stocks are being kept low during the year-end inventory period. Scrap collections are poor, a condition prevailing during the winter months. Prices have reached a point where scrap is handled at scarcely any profit.

The price realized for scrap barely covers the cost of collecting and transporting the material from points adjacent to the reclaiming plants. Changes of price in the quotations for December are noted in inner tube grades and mechanical varieties of scrap. The revisions are downward in every case, and the spreads are narrower.

BOOTS AND SHOES. Boot and shoe scrap is somewhat more in demand than one month ago. Collectors are not receiving enough for their stock to induce them to sort black from colored goods. Quotations are unchanged from the November figures.

INNER TUBES. There is a fair movement of inner tubes for domestic consumption, and for No. 1 tubes for export. The reduction of December quotations below those of one month ago are No. 1, ¼-cent; No. 2, ⅛-cent; Red, ¼-cent; and Mixed tubes ⅜-cent.

TIRES. Collections for the next three or four months will be relatively light because of winter weather conditions. For this reason prices may stiffen slowly if reclaim production increases after January 1. No changes have taken place in quotations of tire scrap varieties.

MECHANICALS. Rubber covered garden hose and steam and water hose are unchanged. All other qualities of mechanical scrap have been reduced ⅛-cent a pound in general, except air brake hose which has declined $2.50 per ton.

HARD RUBBER. This grade is down two cents, and trade is very slack.

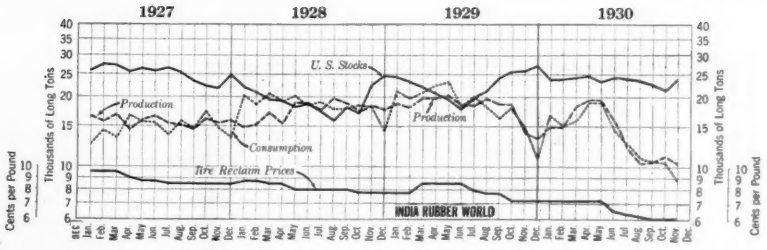
CONSUMERS' BUYING PRICES

Carload Lots

Delivered Eastern Mills

December 27, 1930

	Prices
Boots and Shoes	
Boots and shoes, black. 100 lb.	$1.10 @$1.15
Untrimmed arctics....100 lb.	.70 @ .80
Tennis shoes and soles. 100 lb.	.60 @ .70
Inner Tubes	
No. 1, floating .....lb.	.04¾ @ .05
No. 2, compound .....lb.	.02 @ .02⅛
Red .....lb.	.02 @ .02⅛
Mixed tubes .....lb.	.01⅞ @ .02
Tires	
Pneumatic Standard	
Mixed auto tires with beads .....ton	11.50 @12.00
Beadless .....ton	16.00 @16.50
Auto tire carcass.....ton	17.00 @17.50
Black auto peelings....ton	20.00 @21.00
Solid	
Clean mixed truck....ton	**24.50 @25.50**
Light gravity.....ton	29.00 @30.00
Mechanicals	
Mixed black scrap.....lb.	.00¾ @ .00¾
Hose, air brake.....ton	11.00 @13.00
Garden, rubber covered..lb.	.00¾ @ .00½
Steam and water, soft..lb.	**.00¾ @ .00½**
No. 1 red .....lb.	.01⅞ @ .02⅛
No. 2 red .....lb.	.01 @ .01⅜
White druggists' sundries lb.	.01⅞ @ .02¼
Mechanical .....lb.	.01⅛ @ .01¼
Hard Rubber	
No. 1 hard rubber.....lb.	.08 @ .09



Production, Consumption, Stocks, and Prices of Tire Reclaim

Reclaimed Rubber

RECLAIMERS are operating their plants at a steady, moderate rate, balancing output closely to demand and keeping somewhat in advance of it. This plan has been followed for a year during which period monthly stocks in the U. S. have been maintained at approximately 24,000 tons.

The ratio of consumption of reclaim to crude in November was 37.5 per cent, down 1.8 from October. The average ratio from January to November inclusive was 41.7 per cent. This average is down 4.1 per cent from the ratio last January.

That it has been maintained so well during the year, while the price of crude declined so rapidly, speaks well for the high technical value of reclaim and the research work of reclaimers who have developed a full line of dependable and standardized products at remarkably low and stabilized prices. While the reclaim prices have been depressed by the decline in crude rubber, the highest grades of reclaim are priced at practically crude rubber levels because of their intrinsic technical merit.

It has been remarked in rubber reclaiming circles that the demand for reclaim follows closely that for iron and steel, the generally accepted business barometer. This observation, if well based, would seem to indicate that reclaimed rubber demand is influenced by general industrial activity than by crude rubber prices. It is less a substitute for crude than formerly.

The decline of whole tire reclaim to the present level has been very gradual since 1926; the most abrupt drop was about ¾-cent last June. Since that time black tire reclaim has been stabilized at 6 cents. Unwashed shoes and truck tire stock are also steady at 6 cents.

Quotations on the standard reclaims listed below remain the same as reported one month ago and have been essentially unchanged for two months. It should be noted, however, that the prices are firm, and demand steady and seasonal.

New York Quotations

December 27, 1930

	Spec. Grav.	Price Per Pound
High Tensile		
Super-reclaim, black...	1.20	$0.08¼ @$0.08½
red	1.20	.08 @ .08¼
Auto Tire		
Black	1.21	.05¾ @ .06
Black selected tires....	1.18	.06 @ .06½
Dark gray	1.35	.07 @ .07½
White	1.40	.08½ @ .08¾
Shoe		
Unwashed	1.60	.06 @ .06¼
Washed	1.50	.07¾ @ .08
Tube		
No. 1	1.00	.08¼ @ .08½
No. 2	1.10	.07¼ @ .07½
Truck Tire		
Truck tire, heavy gravity	1.55	.06 @ .06¼
Truck tire, light gravity	1.40	.06¼ @ .06½
Miscellaneous		
Mechanical blends.....	1.60	.05 @ .05½

United States Reclaimed Rubber Statistics—Long Tons

Year	Production	Consumption	Consumption Per Cent to Crude	United States Stocks*	Exports
1925	132,930	137,105	35.6	13,203	4,571
1926	180,582	164,500	45.9	23,218	5,391
1927	189,144	178,471	47.6	24,980	8,540
1928	208,516	223,000	50.4	24,785	9,577
1929	219,037	224,253	47.9	27,464	12,721
1929					
January	18,685	21,068	49.1	24,394	941
February	18,094	19,829	47.7	23,305	1,028
March	19,984	20,068	46.7	22,076	1,344
April	19,899	21,574	47.3	20,680	1,498
May	20,385	23,176	47.1	19,479	1,299
June	18,416	18,141	42.0	17,980	961
July	18,387	20,236	48.7	19,679	1,202
August	19,787	18,230	47.6	22,309	860
September	18,660	16,416	47.2	24,984	657
October	18,968	18,024	51.8	25,474	830
November	14,363	14,742	53.4	26,080	1,232
December	13,429	11,089	47.1	27,464	869
1930					
January	15,010	16,785	45.8	24,241	954
February	15,847	14,918	45.5	24,241	1,203
March	17,400	15,616	43.2	24,415	1,048
April	17,828	17,321	43.0	24,592	740
May	17,812	17,473	43.7	23,356	939
June	15,745	14,410	41.6	24,484	641
July	12,320	12,688	42.3	23,870	778
August	10,361	10,999	35.9	23,610	807
September	10,460	10,480	41.4	22,593	656
October	11,298	10,724	39.3	21,729	572
November	10,763	8,816	37.5	24,007	437

* Stocks on hand the last of the month or year.

Compiled by The Rubber Manufacturers Association, Inc.

Compounding Ingredients

THE market for compounding ingredients was seasonally dull during December. Certain of the large companies in the Akron district closed for the holidays and inventory taking from December 20 to January 5. Production is to be stepped up when the plants reopen in January.

ACCELERATORS. The list of accelerators has been increased by the addition of Altax, a safe accelerator of universal applicability adapted for the higher curing temperatures. It may be popularly known as Captax-disulphide.

Retardex is another new material in the accelerator field. It is designed to be used with those accelerators employed in low temperature curing stocks. Its effect is to render such stocks safe against scorching when processed or stored and also improve tensile properties of the cured product.

AGE RESISTERS. The selection of age resisters like that of accelerators has been enlarged. The latest comer is called Zalba. It is a non-discoloring antioxidant that also retards fatigue deterioration and is adapted to protect light colored stocks.

CARBON BLACK. During December the demand for carbon black was slow. The price was based at 4 cents a pound, Texas. Consumers of rubber black have been active placing contracts for their early 1931 needs, and the price is now stabilized.

CLAY. The tonnage going into rubber goods, particularly tires, is much reduced over that used in the past because of the competition experienced from carbon black at its current low prices.

LITHARGE. The demand is small, seasonal, and of the hand-to-mouth order. Prices are firm and unchanged.

LITHOPONE. A price reduction of ¾ cent per pound was announced early in December. This reduction was made retroactive to December 1, the first change made in the price of lithopone since November, 1926, and was occasioned by reducing the price of competitive titanium pigment.

REODORANTS. A new line of materials seems to be in process of development for reodorizing such rubber goods as druggists' and stationers' sundries, spread goods, and novelties. The first of these aromatic materials to appear is known as Rodo.

SOFTENERS. These well established plasticators and cure stabilizers offer a wide choice to the compounder to meet the needs of every class of stock. The group is in steady demand with ample variety of price and compounding adaptability.

V. M. P. NAPHTHA. The business done has been light, with the price holding steady and firm.

ZINC OXIDE. The demand is steady and seasonal for the pre-inventory period. The rubber manufacturing industry consumed 129,847,125 pounds of this material during 1929, compared with the entire output for 1929 of 316,959,131 pounds.

New York Quotations

December 27, 1930

Prices Not Reported Will Be Supplied on Application

Abrasives			
Marble flour	ton	$20.00 @	$25.00
Pumice stone, pwd.	lb.	.02½ @	.04
Rottenstone, domestic	ton	23.50 @	28.00
Rottenstone, English	lb.	.04 @	.05
Silica	lb.	.01¼ @	.05
Accelerators, Inorganic			
Lead, carbonate	lb.	.07¼ @	
red	lb.	.08¼ @	
sublimed blue	lb.	.06¾ @	
sublimed white	lb.	.06¾ @	
super-sublimed white	lb.	.06¾ @	
Lime flour, hydrated	ton	20.00 @	35.00
Litharge	lb.	.07¾ @	
Magnesia, calcined, heavy	lb.	.04 @	
carbonate	lb.	.06 @	.07
Orange mineral A.A.A.	lb.	.10¼ @	
Accelerators, Organic			
A-1	lb.	.22 @	.27
A-5-10	lb.	.31 @	.36
A-7	lb.	.55 @	.65
A-11	lb.	.62 @	.75
A-16	lb.	.57 @	.65
A-19	lb.	.58 @	.75
A-32	lb.	.70 @	.75
Accelerator 49	lb.	.36 @	.41
Aldehyde ammonia	lb.	.65 @	.70
Barak	lb.	@	
B. L. E.	lb.	@	
Butene	lb.	@	
Captax	lb.	@	
Crylene	lb.	@	
paste	lb.	@	
D. B. A.	lb.	@	
D. O. T. G.	lb.	@	.47
D. P. G.	lb.	@	.35
Ethylidine aniline	lb.	.45 @	.47½
Formaldehyde aniline	lb.	.37½ @	.40
Heptene	lb.	@	
base	lb.	@	
Hexamethylenetetramine	lb.	.58½ @	.61
Lead oleate, No. 999	lb.	.13½ @	
Witco	lb.	.15 @	
Lithex	lb.	@	
Monex	lb.	@	
Phenex	lb.	@	
Pipsol	lb.	4.00 @	4.50
Plastone	lb.	@	
R-2	lb.	1.75 @	2.15
base	lb.	4.50 @	5.00
R & H 40	lb.	.40 @	.42½
50	lb.	.40 @	.42½
397	lb.	.75 @	.77½
Safex	lb.	@	
S-P-D-X	lb.	@	
Super-sulphur No. 1	lb.	@	
No. 2	lb.	@	
Tensilac 39	lb.	.40 @	.42½
Thermlo F	lb.	@	
Thiocarbanilid	lb.	.26½ @	28½
Trimene	lb.	@	
base	lb.	@	
Triphenyl guanidine	lb.	.58 @	.60
Tuads	lb.	@	
Ureka	lb.	.70 @	1.00
Accelerators, Organic *(Continued)*			
V. G. B.	lb.	@	
Z. B. X.	lb.	@	
Z-88-P	lb.	$0.50 @	$0.60
Zimate	lb.	@	
Acids			
Acetic 28% (bbls.)	100 lbs.	2.60 @	2.85
glacial (carboys)	100 lbs.	9.73 @	9.98
Sulphuric, 66°	ton	15.50 @	
Alkalies			
Caustic soda, 76% solid	100 lbs.	2.60 @	
Antioxidants			
Age-Rite, powder	lb.	@	
resin	lb.	@	
white	lb.	@	
Albasan	lb.	@	
Antox	lb.	@	
Oxynone	lb.	.68 @	.90
Resistox	lb.	.54 @	.65
Retardex	lb.	@	
Stabilite	lb.	@	
Alba	lb.	@	
Zalba	lb.	@	
Antisun Materials			
Heliozone	lb.	@	
Sunproof	lb.	@	
Binders, Fibrous			
Cotton flock, dark	lb.	.09 @	.10½
dyed	lb.	.50 @	.85
white	lb.	.11½ @	.15½
Colors			
BLACK			
Bone	lb.	.07½ @	
Carbon (see Reenforcers)			
Drop (bbls.)	lb.	.05½ @	.15
Lamplback (commercial)	lb.	.07 @	.08
BLUE			
Blue toners	lb.	.60 @	3.85
Huber, brilliant	lb.	3.50 @	4.00
Prussian	lb.	.35 @	.37
Ultramarine	lb.	.06 @	.30
BROWN			
Huber, mocha	lb.	1.60 @	2.10
Iron oxide	lb.	.03 @	.20
Mapico	lb.	.16 @	
Sienna, Italian, raw	lb.	.05½ @	.12½
GREEN			
Chrome, light	lb.	.27 @	.31
medium	lb.	.28 @	.31
Chromium oxide	lb.	.25 @	.34
Green toners	lb.	1.00 @	3.60
Huber, brilliant	lb.	3.75 @	4.25
ORANGE			
Cadmium sulphide	lb.	.80 @	1.00
Huber, Persian	lb.	.50 @	1.00
Orange toners	lb.	1.40 @	1.60
Colors *(Continued)*			
ORCHID			
Orchid toners	lb.	$1.05 @	$1.75
PINK			
Pink toners	lb.	1.00 @	1.80
PURPLE			
Purple toners	lb.	.60 @	1.90
RED			
Antimony			
Crimson, R. M. P. No. 3	lb.	.48 @	
Sulphur free	lb.	.52 @	
7-A	lb.	.35 @	
Z-2	lb.	.22 @	
Cadmium	lb.	1.15 @	1.25
Huber, brilliant	lb.	1.35 @	1.85
Iron Oxides			
bright pure domestic	lb.	.10 @	.12
bright pure English	lb.	.11 @	
bright reduced English	lb.	.08 @	
bright reduced domestic	lb.	.04 @	.08
Indian (maroon), pure domestic	lb.	.10 @	
Indian (maroon), pure English	lb.	.09¾ @	
Indian (maroon), reduced English	lb.	.08 @	
Indian (maroon), reduced domestic	lb.	.03 @	.07½
Mapico	lb.	.09 @	
Oximony	lb.	@	
Red toners	lb.	.95 @	2.75
Rub-er-red	lb.	.08¾ @	
Spanish red oxide	lb.	.02¾ @	.04
Sunburnt red	lb.	.14 @	
Venetian red	lb.	.01½ @	
WHITE			
Lithopone	lb.	.04¾ @	.05
Alhalith	lb.	.05¼ @	.05½
Azolith	lb.	.04½ @	.05
Cryptone	lb.	.07¼ @	.07½
Grasselli (50 lb. bags)	lb.	.04½ @	.04¾
(400 lb. bbls.)	lb.	.04¾ @	.05
Titanium oxide, pure	lb.	.20 @	
Titanox "B"	lb.	.06½ @	.07
"C"	lb.	.07 @	.07½
Zinc Oxide			
AAA (lead free)	lb.	.06½ @	.07
Azo (factory):			
ZZZ (lead free)	lb.	.06½ @	.07
ZZ (leaded)	lb.	.06¼ @	.06¾
Z (8% leaded)	lb.	.06¼ @	.06¾
Green seal	lb.	.10¾ @	.10½
Green seal, Anaconda	lb.	.10¾ @	.10½
Kadox, black label	lb.	.10½ @	.10½
blue label	lb.	.09½ @	.09½
red label	lb.	.08 @	.08¼
Red seal	lb.	.09¾ @	.09½
Red seal, Anaconda	lb.	.09¾ @	.09¾

New York Quotations

December 27, 1930

Prices Not Reported Will Be Supplied on Application

Colors *(Continued)*

White *(Continued)*

Zinc Oxide (Continued)			
Special	lb.	$0.07	@$0.07¼
White seal	lb.	.11⅜@	.11⅜
White seal, Anaconda	lb.	.11⅜@	.11⅜
XX green	lb.	.07 @	.07¼
XX red	lb.	.06½@	.06¾
Zinc sulphide	lb.	.16 @	.16¼
YELLOW			
Cadmium sulphide	lb.	.65 @	1.40
Chrome	lb.	.16½@	
Huber, canary	lb.	2.80 @	3.30
Mapico	lb.	.12 @	
Ochre, domestic	lb.	.01⅜@	.02¾
French	lb.	.03 @	
Oxide, pure	lb.	.09 @	
Zinc, C. P., imported	lb.	.21 @	

Factice—See Rubber Substitutes

Fillers for Pliability

Flex	lb.	@	
Fumonex	lb.	.04 @	.08
P-33	lb.	@	
Thermax	lb.	@	
Velvetex	lb.	.03 @	.06

Fillers, Ordinary

Asbestine	ton	25.00 @	
Baryta white (f.o.b. St. Louis, bbls.)	ton	23.00 @	
(f.o.b. St. Louis, paper bags)	ton	22.20 @	
Barytes, white, spot	ton	30.00	@40.00
off color, spot	ton	20.00	@25.00
Foam "A" (f.o.b. St. Louis)	ton	23.00 @	
Basofor	lb.	@	
Blanc fixe, dry	lb.	.04½@	
pulp	ton	42.50	@45.00
C-C-O white (f.o.b. St. Louis, bbls.)	ton	15.00 @	
Infusorial earth	ton	45.00	@50.00
Slate flour, gray (fact'y)	ton	6.50 @	
Whiting			
Chalk, imported	100 lbs.	.95	@ 1.50
Domestic	100 lbs.	1.00 @	
Paris White, English cliffstone	100 lbs.	1.50	@ 3.50
Quaker	ton	@	
Sussex	ton	@	
Witco (l. c. l.) (f.o.b. New York)	ton	20.00 @	

Finishes

Mica, amber	lb.	.04	@ .05
Shellac, fine orange	lb.	@	
Starch, corn, pwd.	100 lbs.	3.42	@ 3.62
potato	lb.	.05½@	.06
Talc, domestic	lb.	.01¼@	
dusting	lb.	.01¼@	.04
French	ton	18.00	@22.00
Pyrax A	ton	@	

Inflating Material

Ammonium carb., pwd.	lb.	.10 @	
lump	lb.	.09 @	

Mineral Rubber

Fluxrite (solid)	lb.	@	
Genasco (fact'y)	ton	40.00	@42.00
Gilsonite (fact'y)	ton	37.14	@39.65
Granulated M. R.	ton	@	
Hydrocarbon, hard	ton	@	
Ohmlac Kapak, M. R. (f.o.b. fact'y)	ton	60.00 @	
M. 4 (f.o.b. fact'y)	ton	175.00 @	
Paradura (fact'y)	ton	62.50	@65.00
Parmr Grade 1	ton	23.00	@28.00

Mineral Rubber *(Continued)*

Grade 2	ton	$23.00	@$28.00
Pioneer, M. R., solid fact'y	ton	40.00	@42.00
M. R. granulated	ton	50.00	@52.00
Robertson, M. R., solid (fact'y)	ton	34.00	@80.00
M. R. granulated	ton	38.00	@80.00

Mold Lubricants

Rusco mold paste	lb.	.12 @	.30
Soapbark (cut)	lb.	.09 @	.10
Soapstone	ton	15.60	@25.00

Oils

Kerosene	gal.	.10 @	
Mineral	gal.	.20 @	
Poppy seed oil	gal.	1.70 @	
Rapeseed	gal.	.63 @	
Red oil, distilled	lb.	.08⅝@	.09⅛
Rubber process	gal.	.25 @	
Spindle	gal.	.30 @	

Reenforcers

Aluminum flake (sacks, c. l.)	ton	21.85 @	
(sacks, l.c.l.)	ton	24.50 @	
Carbon Black			
Aerfloted arrow	lb.	.04½@	.09
Century (works, La., c. l.)	100 lbs.	4.10 @	
Disperso (works, La., c. l.)	100 lbs.	4.10 @	
Excello	lb.	.04 @	
Gastex (f. o. b. fact'y)			
contracts	lb.	.03½@	
carload	lb.	.03½@	
less carload	lb.	.03½@	
Micronex	lb.	.04½@	.09
Ordinary (compressed or uncompressed)	lb.	.04 @	.08
Palmer gas black	lb.	.04 @	
Supreme	lb.	.04 @	
Clays			
Bento	lb.	.02½@	.03
Blue Ridge, dark	ton	@	
China	lb.	.01¼@	
Dixie	ton	@	
Dusto	lb.	.05 @	.07
Langford	ton	@	
Lexo (works)	ton	8.00 @	
Par	ton	@	
Perfection	ton	20.00 @	
Suprex	ton	8.00	@20.00
Glue, high grade	lb.	.27 @	.35

Rubber Substitutes or Factice

Amberex	lb.	.15 @	
Black	lb.	.08 @	.12
Brown	lb.	.07½@	.13
White	lb.	.09 @	.15

Softeners

Burgundy pitch	100 lbs.	5.00	@ 7.00
Atlas	100 lbs.	6.50 @	
Corn oil, crude	lb.	.08½@	
Cottonseed oil (P. S. Y.)	lb.	.09 @	
Cycline oil	lb.	.25 @	.34
Degras	lb.	.04 @	.04½
Fluxol	ton	18.00	@80.00
Fluxrite (fluid)	lb.	@	
Palm oil (Lagos)	lb.	.07½@	
(Niger)	lb.	.08 @	
(Witco)	lb.	.05½@	
Para-flux	gal.	@	
Petrolatum, snow white	lb.	.08 @	.08⅛
Pigmentar	gal.	.18 @	.23

Softeners *(Continued)*

Pigmentaroil (tank cars, factory)	gal.	$0.18 @	
(bbls., drums)	gal.	.23 @	
Pine oil, dest distilled	gal.	.54 @	.55
Pine pitch	bbl.	6.00 @	7.00
Pine tar (retort)	gal.	.26 @	
Rosin K (bbls.)	280 lbs.	5.60 @	
Rosin oil, compounded	gal.	.35 @	
No. 3, deodorized	gal.	.57 @	
No. 556, deodorized	gal.	.48 @	
Rubberseed, drums	lb.	.09½@	.10
Rubtack	lb.	.08 @	
Tackol	lb.	$0.09	@$0.18
Tonox	lb.	@	
Witco No. 20	gal.	.08 @	
Woburn oil	lb.	.05½@	.06
Wobonite No. 94	lb.	.03½@	

Solvents

Benzol (90% drums)	gal.	.26 @	
Carbon bisulphide (drums)	lb.	.05½@	.12
tetrachloride (drums)	lb.	.06½@	.07
Dip-Sol	gal.	@	
Dryolene, No. 9	gal.	@	
Gasoline			
No. 303			
Drums, (c. l.)	gal.	.20 @	
Tank cars	gal.	.16 @	
Petrobenzol	gal.	@	
Rub-Sol	gal.	@	
Solvent naphtha (tanks)	gal.	.25 @	
Stod-Sol	gal.	@	
Troluoil	gal.	@	
Turpentine, Venice	lb.	.20 @	
dest distilled	gal.	.35 @	

Stabilizers

Laurex, ton lots	lb.	@	
Stearates			
Aluminum	lb.	.26 @	.27
Calcium	lb.	.26 @	.27
Magnesium	lb.	.28 @	.29
Zinc	lb.	.27 @	.28
Stearex	lb.	.11 @	.15
Stearic acid, dbl. pres'd	lb.	.16 @	18

Vulcanizing Ingredients

Sulphur			
Rubber sulphur	100 lbs.	1.75 @	2.25
Soft rubber (c.l.)	100 lbs.	@	
(l.c.l.)	100 lbs.	@	
Sulphur chloride	lb.	.03½@	.04
Superfine commercial flour (bbls.)	100 lbs.	2.55 @	3.10
(bags)	100 lbs.	2.20 @	2.80
Tire brand, superfine,	100 lbs.	1.75 @	
Tube brand, velvet	100 lbs.	2.30 @	
Velvet flour (240 lb. bbls.)	100 lbs.	2.95 @	3.50
(150 lb. bags)	100 lbs.	2.60 @	3.15
Vandex	lb.	@	
(See also Colors—Antimony)			

Waxes

Beeswax, white, pure	lb.	.41 @	.43
carnauba	lb.	.28 @	.29
ceresin, white	lb.	.10 @	.11
montan	lb.	.06 @	.07
ozokerite, black	lb.	@	
green	lb.	.26 @	.28
Paraffin			
122/124, crude, white scale	lb.	.03¼@	
124/126 crude, white scale	lb.	.03¼@	
125/127 fully refined	lb.	.04¼@	

Miscellaneous Supplies

Bentonite (dispersion clay)	lb.	.02½@	.03
Sponge paste	lb.	@	
Wood flour	ton	23.00 @	40.00

Crude Rubber Imports by Customs Districts

Including latex, dry rubber content

	October, 1930		October, 1929	
	Pounds	Value	Pounds	Value
Massachusetts	4,100,018	$389,808	3,820,485	$697,445
New York	95,969,835	9,235,426	74,760,789	14,277,703
Philadelphia	49,422	4,693	918,774	160,231
Maryland	78,120	6,933	197,660	39,271
New Orleans	1,076,829	86,559	.....	.....
Los Angeles	1,945,084	201,556	3,073,329	562,069
San Francisco	235,287	30,304	111,148	22,023
Oregon	46,840	4,921	33,651	6,850
Ohio	265,479	23,234	3,130,648	554,231
Colorado	112,000	10,183	90,934	19,375
Totals	103,878,914	$9,993,617	86,137,418	$16,339,198

London Stocks, October, 1930

	Landed for Oct. Tons	Delivered for Oct. Tons	Stocks October 31 1930 Tons	1929 Tons	1928 Tons
LONDON					
Plantation	9,227	14,903	77,543	47,661	24,112
Other grades	68	66	54	52	79
LIVERPOOL					
Plantation	†6,633	†2,503	†38,848	†13,903	†2,393
Total tons, London and Liverpool	15,928	17,472	116,445	61,616	26,584

†Official returns from the recognized public warehouses.

Rubber in Paper De-Inking

Printers' ink and various pigments are removed from pulped-up old paper by treating the latter with carbon tetrachloride, trichloroethylene, or other low-boiling organic solvent, non-miscible with water, and a suspension or dispersion agent such as rubber or its isomers.

Cotton and Fabrics

COTTON BULL POINTS

1. The 1930 crop was estimated at 14,243,000 bales of 500 pounds gross weight, based upon December 1 conditions. This is a decrease of 585,000 bales from 1929 and 234,871 from 1928.
2. Chairman Alexander Legge of the Farm Board believes prices have hit bottom.
3. Opportunities and evidences of scale-down buying exist.
4. Prospect is for large reduction in acreage for next year.
5. The Census Bureau on December 19 reported that the cotton spinning industry operated at 80.1 per cent capacity on a single shift basis, compared with 77.1 per cent in October and 100.9 per cent in November of last year.
6. The trend of consumption and mill takings has recently shown a slight movement upward.

COTTON BEAR POINTS

1. Large number of bank failures in the South has halted buying and reduced available funds for loaning.
2. Cotton consumed during November was 414,887 bales of lint, compared with 444,494 in October of this year.
3. Cotton in consuming establishments on November 30 was 1,566,854 bales of lint, compared with 1,352,885 on October 31.
4. Exports for November totaled 907,649 bales of lint, compared with 1,004,120 in October this year, and 1,048,760 in November of last year.
5. Egyptian cotton is weak, and jobbers' trades were suspended there.
6. Strike occurred at Danville, Va.
7. Break in silver and weakness in Shanghai Exchange have reacted unfavorably on business in the British cotton market.
8. Political situation in India has an adverse effect on cotton.
9. Manchester prices broke pre-war averages on December 12, according to Tattersall's Index.
10. Price depreciation in England is causing financial anxiety.
11. Visible supply of American cotton was 8,105,000 bales against 6,152,000 a year ago; while consumption has decreased sharply.
12. Port and storage stocks are extremely heavy.

THE situation in cotton does not look so rosy as it did at the end of last month. Prices have declined abruptly to new low levels even in the face of favorable developments; an instance was the issuance of the crop, which showed a lower figure than expected. But cotton prices fell on the day the report was issued.

The trouble lies in the fact that cotton is not strong enough to about-face all by itself. Stocks, wheat, sugar, silver, and Egyptian cotton have been weak, and the weight of these various adverse trends has dragged on cotton.

The large number of bank failures in the South undoubtedly has had a great deal to do with the poor showing of cotton; for the first eleven months of 1930 a total of 981 banks have failed, and two New York banks with branches were added to the total in December.

Week ended November 29. Liquidation in advance of the holiday, increased offerings, hedge selling against spot cotton, and weakness in foreign markets sent cotton to new lows for the present movement before a slight rally occurred on Saturday.

When March contracts sold at 10.70 cents on Saturday, the price represented a decline of 122 points from the high touched on the rally of late October and was within 27 points of the low record established on October 8. As the market steadied later in the morning, March rose 13 points and closed at 10.83 cents. May contracts at the low of 10.96 cents were 125 points below the high price touched on the recovery of late last month and within 31 points of the low record set on October 8.

On Wednesday a decline of 36 points in Alexandria carried January contracts around 16½ cents, a break of a cent in a week and 11 cents below the government-pegged price of 27½ cents last Spring. The resulting pressure on Liverpool unsettled the market for American contracts, and a loss of almost $1 a bale brought arbitrage selling.

At Memphis the opinion was expressed that the financial situation, along with low prices of cotton, fertilizer costs, and the like, will cause a reduction in cotton acreage through the valley next year that may run up to 25 per cent, as an average, and possibly 50 per cent in a few local areas. Unless the change is radical in fertilizer prices, much less will be used and prospects of a fair yield an acre are dimmed. Prices at the close of November 29 follow:

Position	High	Low	Close	Previous Close
Dec.	10.42	10.40	10.44	10.45
Dec.	10.50	10.37	10.48/50	10.46/47
Jan.	10.53	10.53	10.60	10.59
Jan.	10.60	10.46	10.59/60	10.55/56
Mar.	10.83	10.70	10.83	10.80
May	11.10	10.96	11.09/10	11.06
July	11.25	11.13	11.24/25	11.23
Oct.	11.43	11.30	11.40/41	11.39/41

Week ended December 6. Activity was limited on the cotton market toward the close of the week in anticipation of the bureau report to appear on Monday. The average estimate of the members of the exchange is 14,405,000 bales or more than 400,000 bales less than the last crop.

At the beginning of the week prices sagged to a new low for the movement, with prices the lowest since October 20. The market was a quiet affair, with prices moving in a narrow range. On Friday trading on the Cotton Exchange accounted for the smallest number of contracts so far this season, as operators evened up outstanding interests in advance of Monday's annual government estimate.

A member of the Farm Board reported deliveries to cooperative associations as 2,000,000 bales to December 1, and 500,000 to 1,000,000 bales more are expected to be received in the remainder of the season. With 1,300,000 bales carried over from the 1929 crop, this would give the Farm Board control of approximately 4,000,000 bales, or more than 50 per cent of the largest amount carried over in any year since 1921. The takings of American cotton by the world thus far are 4,027,000 bales against 5,437,000 for the same time last year. Cotton on shipboard awaiting clearance, according to the *Chronicle*, is 133,389 bales against 157,163 last year.

Prices at the close of December 6 follow:

Position	High	Low	Close	Previous Close
Dec.	10.41	10.39	10.41	10.36
Dec.	10.40	10.36	10.39	10.36
Jan.	10.48	10.42	10.42	10.43/44
Jan	10.50	10.41	10.42/45	10.45/46
Mar.	10.75	10.70	10.73/74	10.74
May	10.99	10.94	10.97/98	10.98
July	11.18	11.14	11.16	11.16/17
Oct.	11.35	11.31	11.33/34	11.32/33

Week ended December 13. In spite of the fact that the government's estimate of the cotton crop was lower than expected, the market dropped. The market continued to drop for the rest of the week, with new December down to 9.45 cents on Saturday.

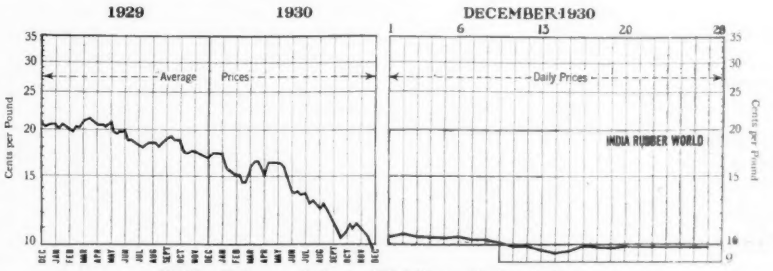
The government's estimate of 14,243,000 bales on December 1 showed a decline of 195,000 from the November 1 figures. The Census Bureau also announced the total of the 1930 cotton crop ginned to December 8. It was announced to have been 12,834,970 running bales, compared with 12,853,166 last year.

Later in the week the Census Bureau's figures were again responsible for the sharp decline. Cotton consumed during November was reported to have been 414,887 bales of lint, compared with 444,494 of lint in October this year, and with 541,153 bales in November of last year. The world supply of all kinds of cotton is unprecedented, being up to 10,044,000 bales, or 1,800,000 bales larger than a year ago.

Not only did the market have to contend with the unfavorable reports in our own market, but Egyptian cotton dropped like an avalanche. Liverpool cables have been weak; while the price of silver has depressed the market in China.

The situation has become alarming at Alexandria. The Bourse Commission held an urgent extraordinary meeting at which it decided that cotton brokers should not be allowed to effect sales for clients who have not deposited margins. The Government Cotton Commission announced suspension of jobbers' business at Alexandria for fifteen days, but this ruling did not apply to exchange members.

Our market has declined 210 to 220 points in the active months from the levels of last October's rally, and a large short interest has been created.



Daily Prices of Spot Middling Upland Cotton

Prices at the close of December 13 were:

Position	High	Low	Close	Previous Close
Dec.	9.60	9.50	9.45	9.70
Dec.	9.65	9.45	9.45	9.70/71
Jan.	9.70	9.58	9.52	9.73
Jan.	9.70	9.53	9.53/58	9.75
Mar.	9.98	9.83	9.83/85	10.03/04
May	10.27	10.10	10.10/12	10.30/32
July	10.46	10.25	10.26/27	10.50/51
Oct.	10.67	10.50	10.50	10.68/70

Week ended December 20. Continuing in the trend of the previous week, cotton dropped to the lowest levels of the year before a rally was made. The upturn followed the sharp rise in securities which was registered in the latter half of the week. On Saturday cotton prices were run up about $1 a bale on week-end covering after early selling from the South had run its course.

The beginning of the week saw weakness in copper, oil, and sugar; then the price of silver broke to new low levels, and reports of reduced prices in the wholesale drygoods district operated against all efforts to raise the price of cotton. Finally, the grain market sold off; but cotton was able to disregard this development, and it set its own pace.

Cables from London said that Manchester prices again broke prewar averages, according to Tattersall's index as of December 12, which was issued in London on December 18. Tattersall stated that present conditions were very depressing and further declines in raw cotton had demoralized the markets for the time being. Silver now at new lows is another adverse factor. There is no real hope of improvement until values are more stable.

On December 20 the Bureau announced that cotton of the 1930 crop ginned prior to December 13 aggregated 13,259,622 running bales, compared with 13,456,783 bales to that date last year.

The banking situation and the large stocks of cotton on hand are obstructions to higher prices, that will be hard to surmount.

Prices at the close of December 20 were:

WEEKLY AVERAGE PRICES OF MIDDLING COTTON

Week Ended	Cents per Pound
Nov. 29	10.69
Dec. 6	10.47
Dec. 13	10.03
Dec. 20	9.73
Dec. 27	9.81

Position	High	Low	Close	Previous Close
Dec.	9.75	9.74	9.74/75	9.63
Dec.	9.77	9.60	9.70	9.59
Jan.	9.70	9.54	9.68/70	9.60
Jan.	9.78	9.60	9.75	9.63/65
Mar.	10.06	9.87	10.02/03	9.90/91
May	10.33	10.20	10.29/30	10.19/20
July	10.55	10.42	10.51/53	10.43/45
Oct.	10.72	10.59	10.67/69	10.57/61

On December 22 stocks and grain weakened cotton, and prices fell in the last hour to close from 1 to 8 points off. Outside influences unsettled trading in the last hour, and the list worked back 15 points or more from the day's best figures.

The next day prices were again slightly lower in sympathy with outside markets. An early decline was followed by a rally, but the finish was 2 to 5 points off. Alexandria declined 21 to 31 points.

On December 24 activity was confined largely to evening up before the holiday.

Prices at the close of December 27 were:

Position	High	Low	Close	Previous Close
Jan. (Old)	9.65	9.54	9.65	9.59
Jan. (New)	9.65	9.57	9.65	9.65
Mar.	9.89	9.80	9.89	9.90/92
May	10.16	10.07	10.15/16	10.18
July	10.41	10.30	10.40/41	10.41/42
Oct.	10.60	10.49	10.59/60	10.60

Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. While the year-end demand for the cotton fabric situation is clearing because of the fact that the mills have reduced their stocks of goods to very moderate inventories, consumers' stocks are relatively much less than usual. Manufactured goods are based on cotton somewhat lower in price than the current market.

RAINCOAT FABRIC. Raincoat trade is quiet because the manufacturers are engaged chiefly in the work of preparing samples for the spring trade.

SHEETINGS. Sheetings are quiet, with demand seasonal and moderate. They share with other cotton goods prospects for increased activity after the turn of the year because of the low inventories carried by consumers.

TIRE FABRICS. During the entire month business in tire fabrics was very quiet with the price unchanged. Orders were light and restricted to tire manufacturers filling-in requirements. The average monthly consumption for the first ten months of this year was 14,203,663 pounds as compared with average monthly consumption last year of 17,402,054 pounds.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country
†48,696	Tires	Riga, Latvia
†48,697	Mechanical articles	Prague, Czechoslovakia
†48,698	Hygienic goods	Prague, Czechoslovakia
*48,700	Surgical and sanitary goods	Glasgow, Scotland
†48,701	Sport goods	Sao Paulo, Brazil
†48,713	Balloons	Barcelona, Spain
†48,719	Tennis shoes	Copenhagen, Denmark
*†48,742	Mats, aprons, rubberized tablecloths, gloves, sponges, etc.	Belfast, Ireland
†48,773	Bathing caps	Lourenco Marques, Portuguese East Africa
†48,843	Druggists' sundries	Lima, Peru
†48,858	Sport goods	Vienna, Austria
†48,874	Surgeons' gloves, toys, and balloons	Regina, Canada
†48,886	Heels	San Salvador, El Salvador
*48,919	Sport goods	Mukden, China
†48,920	Tires and tubes	Baghdad, Iraq
*†48,921	Trapezoidal band belting	Lyon, France
†48,922	Belts	Hamburg, Germany
†48,934	Tires and tubes	Lima, Peru
†48,936	Tires and tubes	Nantes, France
*†48,967	Toys and balloons	Valetta, Malta
†48,987	Water bottles, syringes, etc.	Montreal, Canada

* Purchase. † Agency. *† Purchase and agency. ‡ Either.

New York Quotations

December 27, 1930

Drills

38-inch 2.00-yard	*yard*	$0.11½ @
40-inch 3.47-yard		.06⅞ @
50-inch 1.52-yard		.15⅛ @
52-inch 1.90-yard		.12⅜ @
52-inch 2.20-yard		.10⅞ @
52-inch 1.85-yard		.12¾ @

Ducks

38-inch 2.00-yd D. F.	*yard*	.11⅝ @
40-inch 1.45-yard S. F.		.15½ @
72-inch 1.05-yard D. F.		.24¼ @
72-inch 16.66-ounce		.25½ @
72-inch 17.21-ounce		.26⅜ @

MECHANICAL

Hose and belting	*pound*	.24 @

TENNIS

52-inch 1.35 yard	*yard*	.17¾ @

Hollands

RED SEAL

36-inch	*yard*	.12¾ @
40-inch		.13¾ @
50-inch		.19¼ @

GOLD SEAL

40-inch, No. 72	*yard*	.16¼ @
40-inch, No. 80		.17¾ @

Osnaburgs

40-inch 2.35-yard	*yard*	$0.10 @
40-inch 2.48-yard		.09½ @
40-inch 3.00-yard		.07⅞ @
40-inch 10-oz. part waste		.11 @
40-inch 7-oz. part waste		.07½ @
37-inch 2.42-yard		.09½ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	.09¾ @
Bombazine 60 x 48		.08¾ @
Plaids 60 x 48		.11½ @
Plaids 48 x 48		.10½ @
Surface prints 64 x 60		.12 @
Surface prints 60 x 48		.11½ @
Print cloth, 38½-in., 60 x 48		.05 @
Print cloth, 38½-in., 64 x 60		.05¼ @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.08 @	
48 x 48, 2.85-yard		.07 @	.07⅛
64 x 68, 3.15-yard		@	
56 x 60, 3.60-yard		.06⅞ @	
44 x 48, 3.75-yard		.05¾ @	.06
44 x 40, 4.25-yard		.05⅜ @	

Sheeting, 36-inch

48 x 48, 5.00-yard	*yard*	.04¾ @
40 x 40, 6.15-yard		.03⅜ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Peeler, karded	*pound*	$0.33 @

BUILDER 23/11

Peeler, karded	*pound*	.33 @

BUILDER 10/5

Peeler, karded	*pound*	.27 @

CORD 23/5/3

Peeler, karded	*pound*	.33 @

CORD 23/4/3

Peeler, karded	*pound*	.35 @

CORD 23/3/3

Peeler, karded	*pound*	.38 @

CORD 15/3/5

Peeler, karded	*pound*	.31 @

CORD 13/3/3

Peeler, karded	*pound*	.30 @

LENO BREAKER

8-oz. Peeler, karded	*pound*	.33 @
10-oz. Peeler, karded		.32 @

CHAFER

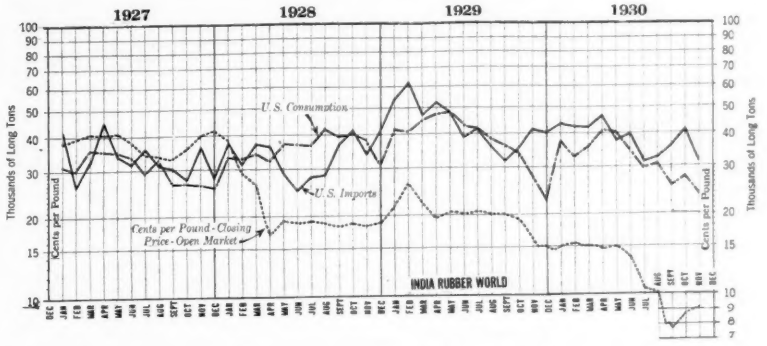
9.5 oz. Peeler karded	*pound*	.35 @
12-oz. Peeler, karded		.34 @
14-oz. Peeler, karded		.33 @

Imports, Consumption, and Stocks

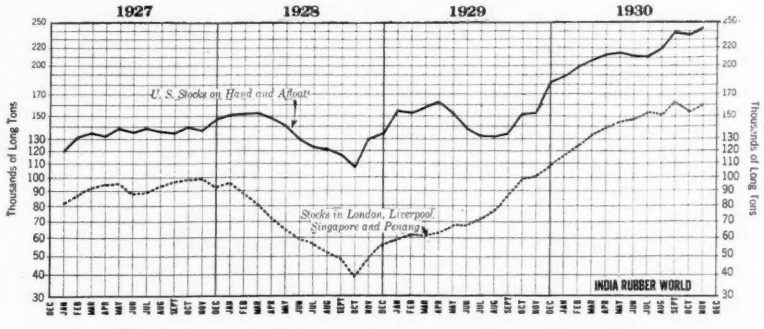
IMPORTATIONS of rubber to the United States for the eleven months ended November 30, 1930, totaled 424,245 tons; while domestic consumption for the same period totaled 355,919 tons. This excess of importations was 19 per cent more than the consumption. Comparison of similar data for the corresponding eleven-month period of 1929 shows as follows: imports, 488,493 tons; domestic consumption, 441,371 tons. The excess of imports was 10.65 per cent more than consumption. Thus in the year of less manufacturing the excess of imports of crude over consumption was over 8½ per cent.

Estimates of crude rubber statistical position for December are: imports, 37,000 tons; domestic consumption, 25,000 tons; afloat to the U. S., 32,000 tons; stocks on hand in the U. S., 203,000 tons.

Present tire manufacturing conditions indicate that total domestic stocks will be again enhanced. An increase of tire production is scheduled for January and February, although it may not be sufficient to raise monthly consumption to a level with imports. Tire manufacturers, however, anticipate much larger output for 1931.



United States Imports, Consumption, and Prices of Ribbed Smoked Sheets



United States, British and Malayan Rubber Stocks

London, Liverpool, Singapore, and Penang stocks December 31 one year ago totaled 108,801 tons. November 29, 1930, stocks at these ports totaled 158,900 tons, an increase of 50,100 tons or 45 per cent.

LONDON STOCKS

Week Ended	Tons
Nov. 29	76,670
Dec. 6	76,877
Dec. 13	77,493
Dec. 20	77,460
Dec. 27	77,328

LIVERPOOL STOCKS

Week Ended	Tons
Nov. 29	39,933
Dec. 6	40,349
Dec. 13	40,281
Dec. 20	40,300
Dec. 27	40,593

United States Statistics of Rubber Imports, Consumption, and Stocks

Twelve Months	*Net Imports Tons	Consumption Tons	Stocks on Hand Tons	Stocks Afloat Tons	Total Domestic Stocks Tons	British and Malayan Stocks — London & Liverpool Tons	British and Malayan Stocks — Singapore & Penang Tons	British and Malayan Stocks — Total Tons
1925	**385,596**	**388,000**	**50,985**	**52,421**	**103,406**	**6,328**	**18,840**	**25,168**
1926	**399,972**	**366,000**	**72,510**	**51,238**	**123,748**	**51,320**	**26,443**	**77,763**
1927	**403,472**	**373,000**	**100,130**	**47,938**	**148,068**	**66,261**	**25,798**	**92,059**
1928	**407,572**	**437,000**	**66,166**	**68,764**	**134,930**	**22,603**	**32,905**	**55,508**
1929	**527,327**	**464,644**	**105,138**	**62,389**	**167,527**	**73,253**	**35,548**	**108,801**
1930								
January	**44,093**	**36,669**	**126,068**	**61,863**	**187,931**	**81,300**	**33,468**	**114,768**
February	**41,373**	**32,726**	**134,790**	**63,404**	**198,194**	**87,100**	**37,550**	**124,650**
March	**42,339**	**35,914**	**141,843**	**63,646**	**205,489**	**93,500**	**38,129**	**131,629**
April	46,997	40,207	148,272	63,261	211,533	99,870	39,880	139,750
May	37,790	39,902	146,179	68,168	214,347	102,936	41,253	144,189
June	39,761	34,643	151,551	58,658	210,209	108,203	39,033	147,236
July	30,970	29,245	152,001	58,326	210,327	108,704	45,459	154,163
August	31,643	30,575	158,604	61,168	219,772	112,989	48,132	161,121
September	36,498	25,288	169,927	60,924	230,851	117,922	44,015	161,937
October	41,016	27,271	185,470	51,123	236,593	114,495	39,930	154,425
November	31,765	23,479	189,925	52,538	242,463	117,226	41,674	158,900

*Including liquid latex, but not guayule.

United States Crude and Waste Rubber Imports for 1930 by Months

	Plantations	Latex	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1930	Total 1929	Balata	Miscellaneous	Waste
January ..... *tons*	46,042	362	747	76	10	125	...	47,362	52,305	127	748	35
February	42,510	275	788	66	14	75	...	43,728	64,538	130	543	144
March	44,002	332	894	37	15	150	...	45,430	53,824	123	738	20
April	48,727	179	881	53	12	75	...	49,927	54,171	87	628	107
May	39,620	444	530	..	1	150	...	40,745	49,180	109	909	87
June	41,631	314	492	..	128	88	...	42,653	44,490	127	829	2
July	33,207	193	489	36	.	159	...	34,084	44,252	104	525	11
August	33,558	621	346	26	7	..	...	34,558	38,292	39	949	30
September	38,304	476	508	27	2	150	..	39,467	32,515	119	748	22
October	42,885	274	526	..	5	39	...	43,729	43,725	72	695	4
November	31,087	280	378	16	4	...	...	31,765	40,621	152	648	...
Total eleven months, 1930 ..... *tons*	441,573	3,750	6,579	337	198	1,011	...	453,448	.	1,189	7,960	462
Total eleven months, 1929 ..... *tons*	*506,403	.....	9,663	323	335	1,176	13	.....	517,913	876	11,223	2,552

*Latex included.

Compiled from Rubber Manufacturers Association statistics.

World Rubber Shipments—Net Exports

Long Tons

	Calendar Years		1930			
British Malaya	1928	1929	Aug.	Sept.	Oct.	Nov.
Gross Exports	409,500	579,524	47,802	48,529	47,770	41,420
Imports	149,787	161,612	10,304	8,087	7,312	7,566
Net	259,713	417,912	37,498	40,442	40,458	33,854
Ceylon	57,271	80,795	7,077	7,966	7,388	5,835
India and Burma	10,790	11,720	600	343	591	†
Sarawak	10,087	11,079	796	680	598	†
British No. Borneo	6,698	7,381	*500	*500	*500	†
Siam	4,813	5,024	335	289	247	†
Java and Madura	58,848	66,010	5,982	5,960	5,916	†
Sumatra E. Coast	82,511	87,589	7,197	6,658	6,956	†
Other N. E. Indies	121,671	134,732	9,520	7,302	6,352	†
French Indo-China	9,616	10,147	394	527	667	654
Amazon Valley	21,129	21,148	809	1,093	669	658
Other America	1,490	996	28	*30	*30	†
Mexican Guayule	3,076	1,275	50	100	64	†
Africa	6,124	4,596	314	*300	*300	†
Totals	653,837	860,404	71,100	72,190	70,736	.....

* Estimate. † Not available. *Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

World Rubber Absorption—Net Imports

Long Tons

	Calendar Years		1930			
Consumption	1928	1929	July	Aug.	Sept.	Oct.
United States	441,400	472,000	29,340	30,675	25,371	27,360
United Kingdom	48,504	72,023	5,903	7,107	8,570	10,647
Net Imports						
Australia	8,430	15,886	84	265	414	609
Austria	3,043	3,324	130	224	158	74
Belgium	7,958	9,445	939	888	824	‡
Canada	30,447	35,453	3,347	2,108	1,578	1,942
Czechoslovakia	3,138	4,650	342	450	411	‡
Denmark	566	799	80	143	113	109
Finland	768	976	99	102	139	109
France	36,498	59,342	3,311	3,953	5,285	‡
Germany	37,855	49,078	3,449	3,515	4,089	3,747
Italy	12,433	17,169	587	886	1,279	2,460
Japan	25,621	34,284	1,197	2,159	2,606	‡
Netherlands	2,243	3,022	172	37	221	439
Norway	728	813	30	86	73	299
Russia	15,134	12,626	567	149	1,373	2,782
Spain	2,000	2,400	*200	*200	*200	‡
Sweden	2,356	3,857	547	416	492	515
Switzerland	566	653	86	63	87	65
Others estimated†	8,000	7,000	600	600	600	‡
Grand totals	687,688	804,800	51,010	54,026	53,883	.....
Minus United States	441,400	472,000	29,340	30,675	25,371	27,360
Total foreign	246,288	332,800	21,670	23,351	28,512	.....

* Estimate to complete table. † Includes Argentina, Brazil, Chile, China, Cuba, Egypt, Estonia, Hungary, Latvia, Mexico, Poland, Portugal, and Union of South Africa. ‡ Not available.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Netherlands East Indies Exports

Long Tons

	Calendar Years		1930				
	1928	1929	Apr.	May	June	July	Aug.
Java and Madura	58,848	66,010	4,802	6,352	4,728	6,022	5,982
Sumatra East Coast	82,511	87,589	6,326	6,661	4,776	5,891	7,197
Other N. E. I.:*							
Atjeh	4,046	4,193	399	205	121	252	268
Riouw	9,533	10,341	1,071	652	592	864	700
Riouw (Free Zone)	.....	.....	221	240	188	107	294
Djambi	32,807	31,085	3,086	3,101	2,497	2,333	1,708
Palembang	18,222	22,476	1,784	1,474	1,107	1,275	1,193
Lampongs	3,015	3,219	286	227	159	206	210
Benkoelen	50	47	4	4	3	3	.....
Sumatra West Coast	1,083	1,283	104	70	46	66	44
Tapanoeli	5,757	6,450	468	600	322	360	505
Banka	659	846	35	43	30	20	12
Billiton	110	124	8	7	2	1	1
West Coast Borneo	21,628	26,160	2,875	2,813	2,131	2,286	3,047
South East Borneo	24,575	29,290	2,439	2,616	2,387	2,225	1,905
Menado	204	193	12	16	14	13	15
Celebes	31	80	4	5	7	10	9
Amboino	32	27	1	2	1	1	1
Total other N. E. I.	121,752	135,814	12,797	12,075	9,607	10,022	9,912
Grand totals	263,111	289,413	23,925	25,088	19,111	21,935	23,091

*Including wet native rubber.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

	September, 1930		Six Months Ended September, 1930	
Unmanufactured	Pounds	Value	Pounds	Value
Rubber, gutta percha, etc.	3,534,060	$386,235	32,498,263	$4,374,406
Rubber, recovered	888,500	49,163	6,661,500	377,298
Rubber and gutta percha scrap	219,900	5,859	2,134,300	62,060
Balata	.....	.....	14,447	5,726
Rubber substitutes	179,300	27,957	395,300	61,861
Totals	4,821,760	$469,214	41,703,810	$4,881,357
Partly Manufactured				
Hard rubber sheets and rods	1,044	$628	38,500	$17,670
Hard rubber tubes	.....	.....	.....	2,451
Rubber thread not covered	17,913	14,358	106,780	91,553
Totals	18,957	$14,986	145,280	$111,674
Manufactured				
Belting	.....	$14,891	.....	$80,540
Hose	.....	10,201	.....	85,586
Packings	.....	5,777	.....	35,627
Boots and shoes, *pairs*	2,292	8,346	13,769	24,192
Clothing including waterproofed	.....	28,751	.....	162,915
Gaskets	.....	1,283	.....	13,940
Gloves	.....	1,345	.....	10,197
Hot water bottles	.....	5,440	.....	14,128
Tires, bicycle, *number*	1,910	1,131	22,313	10,469
Pneumatic, *number*	2,368	28,155	20,602	193,881
Inner tubes, *number*	414	994	8,728	11,344
Solid for automobiles and motor trucks, *number*	60	1,772	491	11,200
Other solid tires	.....	1,537	.....	12,726
Mats and matting	.....	5,025	.....	59,038
Cement	.....	6,820	.....	38,714
Golf balls, *dozen*	1,208	3,078	31,083	81,798
Heels, *pairs*	70,070	2,552	617,261	20,092
Other rubber manufactures	.....	94,016	.....	628,111
Totals	.....	$221,114	.....	$1,494,498
Totals, rubber imports	.....	$705,314	.....	$6,487,529

Exports of Domestic and Foreign Rubber Goods

	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Unmanufactured				
Waste rubber	$2,535	.....	$46,391	.....
Totals	$2,535	.....	$46,391	.....
Manufactured				
Belting	$38,384	.....	$277,133	.....
Canvas shoes with rubber soles	272,298	.....	2,283,329	.....
Boots and shoes	452,705	.....	1,282,178	.....
Clothing, including waterproofed	3,416	.....	16,947	.....
Hose	20,488	.....	119,195	.....
Tires, bicycle	685	.....	3,067	.....
Pneumatic	875,220	.....	6,144,646	.....
Inner tubes	51,443	.....	741,777	.....
Solid	1,814	.....	6,805	.....
Other rubber manufactures	95,897	$1,264	1,288,955	$20,570
Totals	$1,852,350	$1,264	$12,164,032	$20,570
Totals, rubber exports	$1,854,885	$1,264	$12,210,423	$20,570

British Malaya

An official cable from Singapore to the Malayan Information Agency, Malaya House, 57 Charing Cross, London, S.W.1, England, gives the following figures for November, 1930:

Rubber Exports

Ocean Shipments from Singapore, Penang, Malacca, and Port Swettenham.

	November, 1930		
To	Rubber Tons	Latex Tons	Revertex Tons
United Kingdom	7,448	30	..
United States	22,276	60	12
Continent of Europe	6,299	11	26
British possessions	876	..	..
Japan	3,966	..	..
Other countries	277	..	..
Totals	41,142	101	38

Rubber Imports

Actual Imports by Land and Sea

	November, 1930	
From	Dry Rubber Tons	Wet Rubber Tons
Sumatra	415	3,180
Dutch Borneo	353	1,927
Java and other Dutch Islands	82	28
Sarawak	621	10
British Borneo	161	18
Burma	103	6
Siam	125	151
French Indo-China	512	8
Other countries	68	6
Totals	2,440	5,334

United States Statistics

Imports of Crude and Manufactured Rubber

	September, 1930		Nine Months Ended September, 1930	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	79,252,209	$8,460,812	826,773,351	$116,298,400
Liquid latex	900,774	127,751	8,844,421	1,385,956
Jelutong or pontianak	1,087,911	86,664	10,302,123	1,088,743
Balata	100,761	39,512	679,021	264,134
Gutta percha	1,156	1,711	114,366	21,542
Guayule	224,000	28,000	2,312,027	328,861
Siak, scrap and reclaimed	535,863	4,233	8,442,440	116,941
Totals	82,102,674	$8,748,683	857,467,749	$119,504,577
Chicle ..... *Dutiable*	.....	.....	*8,733,245	*$4,470,252
Chicle, crude ..... *Free*	798,658	$362,947	†3,114,416	†$1,481,843
MANUFACTURED—*Dutiable*				
Tires ..... *number*	86	$1,202	5,678	$71,448
Other rubber manufactures	.....	73,078	.....	946,897
Totals	.....	$74,280	.....	$1,018,345

Exports of Foreign Merchandise

RUBBER AND MANUFACTURES				
Crude rubber	3,391,587	$430,772	54,444,136	$8,083,335
Balata	20,064	4,252	1,117,962	240,388
Gutta percha, rubber substitutes, and scrap	2,300	550	51,464	6,820
Rubber manufactures	.....	16,303	.....	148,269
Totals	.....	$451,877	.....	$8,478,812

Exports of Domestic Merchandise

RUBBER AND MANUFACTURES				
Reclaimed	1,470,078	$81,284	17,400,459	$1,030,932
Scrap and old	3,418,310	85,906	37,690,078	1,376,541
Rubberized automobile cloth ..... *sq. yd.*	73,611	33,859	967,630	467,953
Other rubberized piece goods and hospital sheeting. *sq. yd.*	77,622	33,682	1,043,995	446,363
Footwear				
Boots ..... *pairs*	126,891	240,609	632,166	1,375,951
Shoes ..... *pairs*	411,021	540,499	1,659,300	1,872,497
Canvas shoes with rubber soles ..... *pairs*	331,133	191,684	3,340,436	2,166,901
Soles ..... *doz. pairs*	14,838	41,165	94,967	275,997
Heels ..... *doz. pairs*	104,531	67,749	906,801	622,493
Water bottles and fountain syringes ..... *number*	68,906	32,486	322,519	164,832
Gloves ..... *doz. pairs*	9,149	24,965	92,518	235,359
Other druggists' sundries	.....	33,249	.....	252,448
Balloons ..... *gross*	41,611	49,053	519,378	544,587
Toys and balls	.....	10,960	.....	98,836
Bathing caps ..... *doz.*	4,224	11,031	151,049	325,042
Bands	38,441	17,024	444,976	209,230
Erasers	40,199	24,808	387,337	235,882
Hard rubber goods				
Electrical goods	20,813	3,228	903,570	130,945
Other goods	.....	22,933	.....	272,476
Tires				
Truck and bus casings, *number*	54,590	859,733	363,004	7,734,110
Other automobile casings, *number*	147,395	1,309,147	1,573,985	13,749,803
Tubes, auto ..... *number*	127,248	218,040	1,255,605	2,121,874
Other casings and tubes, *number*	4,394	13,290	70,064	206,672
Solid tires for automobiles and motor trucks *number*	1,903	47,708	20,576	641,440
Other solid tires	95,254	16,780	1,095,469	187,929
Tire accessories	.....	87,460	.....	1,009,183
Rubber and friction tape	119,947	34,498	1,152,541	315,321
Belting	240,807	124,967	3,411,200	1,745,264
Hose	486,281	158,795	6,010,379	2,015,814
Packing	139,320	73,390	1,556,686	686,534
Thread	166,355	168,642	1,262,121	1,240,019
Other rubber manufactures	.....	166,629	.....	2,013,701
Totals	.....	$4,825,253	.....	$45,772,929

*Ending June 17, 1930. †Beginning June 18, 1930.

Principal Rubber Stocks

	Long Tons —1930—					
	June	July	Aug.	Sept.	Oct.	Nov.
Malay estates	22,998	25,814	26,430	26,573	25,663	†
S. S. dealers	37,001	38,537	41,513	36,618	34,479	36,884
Other Malay dealers	11,350	12,498	13,052	13,290	12,924	†
Malayan ports	4,263	5,998	5,877	6,830	4,734	4,016
Totals	75,612	82,847	86,872	83,311	77,800	....
London	80,260	81,048	80,656	83,304	78,050	76,730
Liverpool	27,332	28,291	29,789	35,500	38,900	39,930
Totals	107,592	109,339	110,445	118,804	116,950	116,660
United States inventory	155,000	158,445	162,283	171,285	188,310	193,091
Plantation afloat for United States	59,385	58,989	62,149	64,000	*50,441	51,837
Plantation afloat for Europe	20,920	27,220	30,310	31,000	*30,000	†
Totals	80,305	86,209	92,459	95,000	80,441	....
Grand totals	418,509	436,840	452,059	468,400	463,501	....

* Rubber Manufacturers Association statistics raised from 75 to 100%.
† Not available.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

United Kingdom Statistics

Imports

	October, 1930		Ten Months Ended October, 1930	
UNMANUFACTURED Crude Rubber From—	Pounds	Value	Pounds	Value
Strait Settlements	17,976,600	£322,071	153,482,900	£4,239,959
Federated Malay States	7,540,600	133,985	66,828,900	1,854,176
British India	875,200	14,978	12,041,300	346,052
Ceylon and Dependencies	3,990,300	67,479	31,757,400	841,393
Java and Dutch Borneo	3,273,200	56,647	30,567,300	847,550
Sumatra and other Dutch possessions in Indian Seas	3,131,400	64,802	20,046,700	580,231
Other countries in East Indies and Pacific not elsewhere specified	380,700	7,700	3,034,900	84,904
Brazil	372,400	7,753	4,476,300	134,895
South and Central America (except Brazil)	.....	.....	143,600	4,071
West Africa				
French West and Equatorial Africa	.....	....	278,600	7,883
Gold Coast	16,400	273	306,200	8,628
Other parts of West Africa	272,200	4,712	1,558,700	43,029
East Africa, including Madagascar	.....	.....	526,800	15,009
Other countries	117,800	3,206	1,972,000	63,994
Totals	37,946,800	£683,606	327,021,600	£9,071,774
Gutta percha and balata	659,900	49,022	3,936,200	285,707
Waste and reclaimed rubber	823,500	8,181	7,872,300	93,762
Rubber substitutes	.....	.....	118,600	2,436
Totals	39,430,200	£740,809	338,948,700	£9,453,679
MANUFACTURED				
*Tires and tubes				
Pneumatic				
Outer covers	.....	£22,646	.....	£299,064
Inner tubes	.....	2,861	.....	55,175
* Solid tires	.....	3,658	.....	38,089
Boots and shoes *doz. pairs*	85,600	216,363	1,151,198	1,466,346
Other rubber manufactures	.....	197,305	.....	1,876,705
Totals	.....	£442,833	.....	£3,735,379

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	1,503,600	£9,972	17,495,300	£139,803
Rubber substitutes	89,200	1,779	471,700	9,913
Totals	1,592,800	£11,751	17,967,000	£149,716
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£267,004	.....	£3,381,816
Inner tubes	.....	30,733	.....	493,376
Solid tires	.....	7,342	.....	76,324
Boots and shoes *doz. pairs*	20,396	33,828	225,496	322,226
Other rubber manufactures	.....	187,196	.....	2,101,217
Totals	.....	£526,103	.....	£6,374,959

Exports—Colonial and Foreign

UNMANUFACTURED				
Crude rubber To—				
Russia	4,171,200	£149,005	12,290,000	£456,430
Sweden, Norway, and Denmark	214,700	6,967	1,935,000	73,565
Germany	1,813,800	43,319	23,988,200	751,337
Belgium	657,700	20,369	6,752,100	226,721
France	8,832,300	161,679	26,449,000	761,065
Spain	117,300	4,300	805,300	35,098
Italy	962,600	18,830	3,806,000	112,647
Other countries in Europe	609,400	18,030	4,046,100	154,508
United States	81,600	1,429	3,564,700	102,493
Other countries	113,600	4,267	1,310,500	54,104
Totals	17,574,200	£428,195	84,946,900	£2,727,968
Gutta percha and balata	23,100	1,648	486,000	40,703
Waste and reclaimed rubber	10,000	230	81,700	1,661
Rubber substitutes	.....	.....	2,900	60
Totals	17,607,300	£430,073	85,517,500	£2,770,392
MANUFACTURED				
Tires and tubes				
Pneumatic				
Outer covers	.....	£3,421	.....	£59,243
Inner tubes	.....	334	.....	6,659
Solid tires	.....	35	.....	226
Boots and shoes *doz. pairs*	2,318	5,305	22,038	39,897
Other rubber manufactures	.....	5,336	.....	63,137
Totals	.....	£14,431	.....	£169,162

*Motor cars, motorcycles, parts and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until Apr. 30, 1926, inclusive, and tires and tubes until Apr. 11, 1927, inclusive.

Crude Rubber Reexports

Reexports of crude rubber from the United States during November, 1930, were 2,902,187 pounds (1,296 long tons), value $271,847, of which 2,783,424 pounds, value $257,490, went to Canada.

Gross imports of crude rubber, liquid latex, and guayule in November, 1930, amounted to 29,733 long tons. By deducting November reexports the net imports were 28,437 long tons.

Rubber Goods Production Statistics

Tires and Tubes		1930 August	1930 September	1930 October	1929 August	1929 September	1929 October	1928 August	1928 September	1928 October	Cumulative Total from January 1 Through Oct. 31: 1930	1929	1928
Pneumatic tires													
Production	thousands	3,332	2,692	2,866	4,354	3,568	3,689	5,607	5,101	5,495	36,398	49,832	49,779
Stocks, end of month	thousands	8,678	7,849	7,842	10,669	9,656	9,633	7,539	7,324	8,640	.....	.....	.....
Shipments													
Domestic	thousands	3,976	3,360	2,613	5,667	4,330	3,520	6,131	5,191	4,096	36,159	48,230	47,041
Export	thousands	164	165	186	217	168	199	179	168	191	1,798	2,025	1,571
Inner Tubes													
Production	thousands	3,837	3,053	3,161	4,385	4,152	4,000	6,264	5,327	5,197	37,343	49,441	52,089
Stocks, end of month	thousands	8,589	8,052	8,414	10,618	10,068	10,242	10,466	10,158	11,464	.....	.....	.....
Shipments													
Domestic	thousands	4,492	3,525	2,659	6,028	4,562	3,629	6,886	5,245	4,138	37,865	49,668	49,490
Export	thousands	118	108	119	109	125	122	132	121	108	1,126	1,298	1,004
Solid and Cushion													
Production	thousands	16	14	18	32	28	35	52	43	47	178	351	446
Stocks, end of month	thousands	90	82	78	118	111	111	149	151	153	.....	.....	.....
Shipments													
Domestic	thousands	22	22	19	40	34	34	49	42	43	207	364	416
Export	thousands	1	1	1	3	2	2	5	2	3	15	24	37
Other Rubber Products													
Rubber-proofed fabrics, production													
Total	thous. of yds	3,458	5,046	5,209	5,085	5,507	6,118	4,613	4,966	5,914	37,950	44,047	34,948
Auto fabrics	thous. of yds.	678	733	915	1,349	1,120	778	764	780	609	8,970	9,845	7,823
All other	thous. of yds.	975	1,064	1,254	1,317	1,324	1,720	1,251	1,007	1,296	10,716	13,175	8,924
Raincoat fabrics	thous. of yds.	1,805	3,249	3,040	2,419	3,063	3,618	2,598	3,179	4,009	18,264	21,025	18,201
Rubber heels													
Production	thous. of pairs	13,735	14,322	16,460	23,095	21,702	22,386	21,289	21,451	21,932	153,875	199,482	200,673
Shipments													
To shoe manufacturers	thous. of pairs	8,813	9,244	9,354	14,942	13,645	13,746	11,642	9,207	9,813	94,283	123,821	101,105
To repair trade	thous. of pairs	6,622	6,681	8,291	8,025	7,859	7,994	9,244	9,199	9,580	60,501	74,052	80,624
For export	thous. of pairs	780	1,083	966	1,098	1,054	920	729	875	1,262	9,504	10,628	8,979
Stocks, end of month	thous. of pairs	33,226	31,601	29,353	43,960	42,958	42,109	49,511	49,751	50,111	.....	.....	.....
Rubber soles													
Production	thous. of pairs	1,473	2,193	3,056	2,948	2,841	3,502	3,461	2,725	2,297	25,067	28,096	32,225
Shipments													
To shoe manufacturers	thous. of pairs	1,161	1,691	2,638	2,548	2,185	2,691	2,209	1,703	1,655	21,417	22,322	18,842
To repair trade	thous. of pairs	317	333	492	517	618	647	917	893	958	3,817	6,046	9,300
For export	thous. of pairs	74	74	82	78	47	90	46	29	328	598	571	2,246
Stocks, end of month	thous. of pairs	2,289	2,729	2,520	3,319	3,316	3,443	5,633	5,501	5,212	.....	.....	.....
Mechanical rubber goods													
Shipments													
Total	thous. of dolls.	4,452	4,083	4,186	6,792	5,906	5,887	6,306	5,393	5,837	51,727	65,087	58,632
Belting	thous. of dolls.	1,248	1,045	954	1,940	1,490	1,477	1,888	1,412	1,387	12,278	15,895	14,477
Hose	thous. of dolls.	1,682	1,473	1,554	2,196	1,964	2,135	2,068	1,731	2,026	20,784	24,063	21,798
All other	thous. of dolls.	1,622	1,565	1,678	2,656	2,452	2,274	2,360	2,250	2,424	18,663	25,129	22,376
Rubber bands, shipments	thous. of lbs.	164	172	197	196	189	216	193	186	216	1,996	2,163	1,935
Rubber flooring, shipments	thous. of sq. ft.	559	529	682	598	630	543	583	754	559	5,618	5,644	5,819
Calendered rubber clothing													
Production	no. coats and sundries	44,952	37,097	41,291	96,281	93,444	99,588	74,509	92,588	106,005	580,264	854,308	1,018,344
Net orders	no. coats and sundries	26,348	39,364	25,082	37,906	49,940	76,194	64,695	108,156	75,482	510,010	599,557	709,038

Source: *Survey of Current Business*, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Tire Production Statistics

	High Pressure Pneumatic Casings: All Types Inventory	All Types Production	All Types Total Shipments	Cord Inventory	Cord Production	Cord Total Shipments
1928	10,217,708	58,457,873	55,721,937	3,580,576	19,302,218	19,351,380
1929	9,470,368	54,980,672	55,515,884	2,290,236	13,765,025	15,016,460
1930						
January	9,539,358	3,588,862	3,525,404	2,382,959	804,783	713,713
February	9,928,838	3,644,606	3,356,104	2,474,495	662,419	599,599
March	10,010,173	3,890,981	3,773,865	2,458,117	572,417	588,613
April	10,461,208	4,518,034	4,071,822	2,493,603	656,281	610,308
May	10,745,389	4,573,895	4,173,177	2,421,953	618,012	677,999
June	10,621,634	4,097,808	4,234,994	2,258,517	584,089	748,203
July	9,449,318	3,193,057	4,357,836	1,835,760	425,844	845,072
August	8,678,164	3,332,489	4,139,900	1,516,904	506,305	869,662
September	7,849,411	2,692,355	3,524,141	1,285,619	521,835	759,366
October	7,842,150	2,865,933	2,799,440	1,290,536	617,713	616,919

	Balloon Casings Inventory	Balloon Casings Production	Balloon Casings Total Shipments	Solid and Cushion Tires Inventory	Solid and Cushion Tires Production	Solid and Cushion Tires Total Shipments
1928	6,594,978	38,878,218	35,931,982	152,120	508,223	512,602
1929	7,160,127	41,128,577	40,377,781	122,200	409,344	427,779
1930						
January	7,139,154	2,779,864	2,805,740	126,784	25,049	21,476
February	7,436,247	2,975,922	2,750,324	127,793	22,302	21,005
March	7,535,468	3,311,978	3,177,634	123,179	19,329	23,951
April	7,951,317	3,854,540	3,454,171	116,595	17,335	24,232
May	8,323,436	3,955,883	3,495,178	108,055	16,752	24,426
June	8,363,087	3,513,719	3,486,791	106,589	16,612	19,613
July	7,613,558	2,767,213	3,512,764	100,930	12,893	20,545
August	7,161,260	2,796,184	3,270,238	90,245	16,064	23,519
September	6,563,792	2,170,520	2,764,775	81,692	14,361	23,318
October	6,551,614	2,248,220	2,182,521	78,322	17,567	20,309

	High Pressure Inner Tubes Inventory	High Pressure Inner Tubes Production	High Pressure Inner Tubes Total Shipments	Balloon Inner Tubes Inventory	Balloon Inner Tubes Production	Balloon Inner Tubes Total Shipments
1928	5,037,716	23,255,891	23,749,966	7,049,748	36,878,990	34,095,223
1929	3,339,451	16,100,281	17,718,806	6,889,213	38,921,749	38,719,177
1930						
January	3,233,813	783,709	889,208	6,911,422	2,898,682	2,992,752
February	3,243,130	675,126	680,989	7,171,395	3,030,745	2,786,578
March	3,137,472	619,416	696,161	7,392,794	3,331,739	3,082,456
April	3,144,558	678,152	674,032	7,871,181	3,728,177	3,202,261
May	2,983,388	683,236	769,463	8,098,115	3,745,131	3,289,384
June	2,781,524	641,508	914,909	8,107,920	3,318,464	3,297,573
July	2,098,130	634,751	1,252,806	7,227,472	2,516,356	3,431,376
August	1,853,988	1,084,265	1,335,284	6,735,316	2,752,615	3,274,572
September	1,715,202	913,190	1,047,783	6,336,919	2,140,234	2,584,675
October	1,900,435	955,127	754,595	6,513,143	2,205,921	2,023,370

	Cotton and Rubber Consumption Castings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Cotton and Rubber Consumption Castings, Tubes, Solid and Cushion Tires: Crude Rubber Pounds	Consumption of Motor Gasoline (100%) Gallons
1928	222,243,398	600,423,401	13,633,452,000
1929	208,824,653	583,039,984	14,748,552,000
1930			
January	14,559,163	42,108,149	1,080,660,000
February	13,766,977	40,378,929	1,060,640,000
March	14,655,987	43,910,926	1,241,240,000
April	17,263,963	51,151,863	1,382,400,000
May	17,436,928	52,130,471	1,459,880,000
June	15,034,336	45,705,967	1,508,220,000
July	13,399,389	39,365,247	1,533,880,000
August	13,222,934	40,735,541	1,497,920,000
September	10,916,524	33,382,031	1,513,200,000
October	11,780,432	36,097,115	1,355,214,000

Rubber Manufacturers Association figures representing 80 per cent of the industry since January, 1929, with the exception of gasoline consumption.

Dealers' Stocks of Tennis Shoes in the United States[1]

November 1, 1930

THE Rubber Division of the Department of Commerce has just completed a survey of dealers' stocks of tennis shoes in the United States, as of November 1, 1930. Reports from 18,200 dealers, covering the entire country, show total stocks of canvas rubber-soled shoes as of November 1 as 2,685,889, an average of 147.6 pairs per dealer.

In the present survey, as in a similar survey on November 1, 1929, dealers were asked to report their stocks of tennis shoes under various price ranges, which are indicated in the following tables. The reports show that the stock of the average dealer was as follows on November 1 of the last two years:

STOCK OF AVERAGE DEALER

Cost Price Per Pair to Dealer	Number of Pairs on November 1	
	1929	1930
Up to 75c	45	57
76c. to $1	31	38
$1.01 to $1.50	29	29
Above $1.50	17	16
Specialty oxfords and pumps	5	7
Total average dealer stock	127	147

Special Note

In all of the comparisons in this circular between the stocks indicated by the surveys of November 1, 1929, and 1930, the November 1, 1929, figures do not include returns from four questionnaires last year reported as "National Stocks" owing to the fact that the actual physical stocks were carried in several states. If these stocks were added to the 1929 returns, the average dealers' stock would have been 137 pairs instead of 127 pairs. In the present survey several returns were received from separate stores operated by large chain-store and mail-order-house groups; these returns were assimilated under the state returns and not considered as "National Stocks" as in the previous survey. The stocks of tennis shoes held by the four large companies considered as "National Stocks" in the November 1, 1929, survey, were as follows:

Cost Price Per Pair to Dealer	Total Pairs
Up to 75c	134,137
76c. to $1	44,062
$1.01 to $1.50	28,270
Above $1.50	5,128
Specialty oxfords and pumps	369
	211,966

[1]Department of Commerce, Bureau of Foreign and Domestic Commerce. Washington, D. C., Special Circular No. 2,858, Rubber Division.

TOTAL AVERAGE STOCKS, SHOWING AVERAGE NUMBER OF PAIRS PER DEALER

NOVEMBER 1, 1930

Cost Price Per Pair to Dealer	Number of Dealers Reporting	Number of Pairs	Average Per Dealer Pairs	Percentage of Total Dealers	Percentage of Total Stocks
Up to 75c	13,612	1,037,754	76.2	74.8	38.7
76c. to $1	14,533	687,277	47.3	79.9	25.6
$1.01 to $1.50	12,638	524,726	41.5	69.4	19.5
Above $1.50	8,519	301,823	35.4	46.8	11.2
Specialty oxfords and pumps	2,912	134,309	46.1	16.0	5.0
Total	18,200	2,685,889	147.6	100.0	100.0

NOVEMBER 1, 1929

Cost Price Per Pair to Dealer	Number of Dealers Reporting	Number of Pairs	Average Per Dealer Pairs	Percentage of Total Dealers	Percentage of Total Stocks
Up to 75c	15,490	948,708	61.2	73.9	35.7
76c. to $1	15,900	652,992	41.1	75.9	24.5
$1.01 to $1.50	14,483	604,050	41.7	69.1	22.7
Above $1.50	9,867	357,544	36.2	47.1	13.4
Specialty oxfords and pumps	2,419	98,603	40.8	11.5	3.7
Total	20,948	2,661,897	127.1	100.0	100.0

Dealers with Total Stocks of Over 500 Pairs of Tennis Shoes

A separate tabulation was made for those firms whose stocks of tennis shoes amounted to more than 500 pairs each. In the present survey 539 dealers were in this group, having a total of 971,890 pairs of tennis shoes or an average of 1,803 pairs, compared with 487 dealers having 742,290 pairs or an average of 1,524 pairs on November 1, 1929. The details, by states, of the dealers having more than 500 pairs each, are shown in the table at the bottom of the page.

Mailing List Data

The total mailing list used in this survey consisted of 117,000 names. In addition to the 18,200 reports submitted by dealers with stocks on hand as of November 1, 1930, reports were received from 7,334 dealers stating either that they no longer sold tennis shoes or that they had no stocks on hand at the present time. The Post Office Department returned 1,750 envelopes addressed to dealers owing to failure to locate or because of improper address.

DEALERS WITH OVER 500 PAIRS IN STOCK, BY STATES

	No. of Dealers	No. of Pairs		No. of Dealers	No. of Pairs
Alabama	6	7,515	Nevada	..	.....
Arizona	2	1,520	New Hampshire	3	2,060
Arkansas	4	6,099	New Jersey	22	15,552
California	30	122,821	New Mexico	...	.....
Colorado	3	2,352	New York	86	141,469
Connecticut	11	9,761	North Carolina	4	2,562
Delaware	2	2,032	North Dakota	...	.....
District of Columbia	5	2,908	Ohio	30	89,683
Florida	6	13,215	Oklahoma	3	2,393
Georgia	6	17,091	Oregon	3	5,088
Idaho	...	.....	Pennsylvania	60	68,883
Illinois	22	56,801	Rhode Island	3	4,006
Indiana	10	16,191	South Carolina	5	10,581
Iowa	9	9,165	South Dakota	2	1,475
Kansas	5	4,619	Tennessee	9	21,786
Kentucky	9	9,278	Texas	14	23,653
Louisiana	6	4,600	Utah	3	2,734
Maine	11	10,644	Vermont	4	3,477
Maryland	9	12,294	Virginia	6	4,697
Massachusetts	34	69,334	Washington	6	4,031
Michigan	16	11,053	West Virginia	7	15,377
Minnesota	15	25,496	Wisconsin	9	7,475
Mississippi	5	4,331	Wyoming	1	884
Missouri	23	117,352	Unallocated	5	3,674
Montana	2	1,479			
Nebraska	3	2,399	Total	539	971,890

New Incorporations

CAROLINA RUBBER HOSE CO., Nov. 18 (N. C.), capital stock $50,000, paid in stock $2,700. Harry R. Ferguson and Mattie M. and Miles J. Smith, all of Salisbury, N. C. Manufacture mechanical rubber goods, tires, tubes, etc.

EASTERN TIRE & RUBBER CO., Nov. 20 (N. J.), capital stock 30 shares, no par value. Principal office, 31 Clinton St., Newark, N. J. Harry Griffinger, Gertrude Schutzman, and Samuel Lieberman, all of 31 Clinton St., Newark, N. J. Manufacture tires and rubber goods.

OMAHA RUBBER CO., Sept. 29 (Del.), capital stock 10,000 shares Class A common stock, par value $50; 10,000 shares Class B common stock, no par value; and 1,000 shares Class C common stock, no par value. H. E. Grantland, C. S. Peabbles, and L. E. Gray, all of Wilmington, Del. Manufacture tires, tubes, and all kinds of rubber goods.

PENCIL CORP. OF AMERICA, Nov. 7 (N. J.), capital stock 2,500 shares, no par value. Principal office, 60 Park Pl., Newark, N. J. Mary McLaughlin, 326 Gist Pl., Orange; Ruth Flasler, 197 Fairmount Ave., and Florence Gottfroed, 277 N. Fifth St., both of Newark, all in N. J. Manufacture and refine rubber.

WEST BERGEN RUBBER & BUS TRANSPORTATION CO., Dec. 8 (N. J.), $100,000. Principal office, 311 Westside Ave., Jersey City, N. J. Jacob Grossman, 305 Barrick St., Louis Grasso, 127 Roosevelt Ave., and William Bauman, 382 Fulton St., all of Jersey City, N. J. Manufacture and deal in tires and tubes.